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THE
CAUSES AND PREVENTION
OF MATERNAL MORTALITY

BY

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To the
Members of the Obstetrical Section
of the
Third Australasian Medical Congress,
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PREFACE

ONE of the most important problems before the medical profession at the present time is how to reduce the rate of maternal mortality, and this book is a small contribution towards its solution. It is based on my experience of the practice and teaching of midwifery while in Ireland, and on the results of my advisory work on the same subject under the Health Department of New Zealand.

I trust that it may be found of some value by the many members of the medical and nursing professions who are also looking for a solution, either to help them in their professional work or to enable them to help or to guide others.

I am indebted, for assistance in its preparation, to Dr. Watt, Deputy Director-General of the Health Department, New Zealand ; Dr. Lindsay, Gynæcologist to the Christchurch Hospital, New Zealand ; The Government Statistician, New Zealand ; and Dr. Sydney Allen, whose previous valuable report to the Health Department on obstetrical matters generally in Europe has been of much service to me.

Perhaps, in conclusion, I should make it clear that the book is an expression of my own opinion, for which the Health Department of New Zealand takes no responsibility.

HENRY JELLETT.

CHRISTCHURCH, N.Z.

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MATERNAL MORTALITY

CHAPTER I

INTRODUCTORY

THE art of midwifery has passed through many stages. Originally it may be assumed that women delivered themselves of their children as do wild animals, and with as little danger to themselves. Gradually, occasional difficulties introduced themselves, and in response to them elementary methods of assistance were devised. Difficulties increased, and methods of assistance became more developed. Greater use was made of the methods evolved, and, as a result, new difficulties and dangers appeared. Human life became more complicated, its relations more crowded and artificial, and pre-existing disease became more common. The mechanical complications of labour became greater, and the need for assistance more frequent. To the ordinary risks were added the risks of blood infections brought by those whose object was to assist, with the probable result that the efforts made to reduce the risk of labour instead multiplied that risk. There can be little doubt that maternal mortality before the time of Semmelweiss was considerably greater than it would have been if every woman had been left unaided. There is even a certain element of possi-

bility that, in the case of the healthy woman, this is still so. In the past, interference during labour was limited, and asepsis was unknown. In the present, interference is frequent, and asepsis is occasional. In the future, if the rate of maternal mortality is to be brought to the minimum, it will be necessary to reverse this relationship. Interference must so far as possible be avoided, and asepsis must be positive.

The art of midwifery has been devised with three aims before it, and it is being slowly perfected. The first is to bring a mother safely through a normal pregnancy, labour, and puerperium. The second is to ensure the delivery of a healthy infant. The third is to leave the mother in as normal a condition at the end of the puerperium as she was at the beginning of pregnancy. Similarly, there are three basic essentials on which this art is built—knowledge, skill, and suitable environment. Knowledge is necessary to avoid both complications and interference, and to treat the one and to regulate the other should this become inevitable. Skill is necessary to obtain the fruits of knowledge. Suitable environment, by which I mean the circumstances under which a labour takes place, is necessary in order that the normal and abnormal events of labour may be conducted in an orderly and aseptic manner.

If these three essentials can be obtained, then the risks of childbirth will be reduced to their lowest. If they are absent, or if the possession of a due share of one is allowed to count as an equivalent to the absence of another, then the whole structure falls.

Under such circumstances, as I have already suggested, it is quite possible that, so far as the rate of mortality is concerned, humanity as a whole would be just as well off without it, although individuals might still benefit.

Are these essentials obtainable? I think they are, at any rate to a much greater extent than is the case at present. But, before we shall get them, it will be necessary to throw aside a number of hampering ideas. The position of midwifery in the curriculum of the student, if judged by after consequences, is not and cannot remain inferior to that of medicine or surgery. Even if in the past the medical quack ranked before the surgical barber, and both before the "midwife"—male or female—the fact remains that to-day the badly taught "midwife" can kill more than the highly educated physician can cure, and that a good working knowledge of the art of surgery does not always make the surgeon more successful. If actual results are to be the criterion of relative importance, then I venture to suggest that the results of the obstetrical art, properly practised, are at least as important, though less brilliant, than those of medicine and surgery.

Then there is the public ignorance of the essentials of midwifery—an ignorance which takes many forms. There is one form which places prompt action before everything else, and which drives a practitioner into acts repellent to him. There is another which decries the efforts of the practitioner to obtain an environment that will make asepsis possible, and which grudges the small incidental

expense necessary. There is another form, which considers that a medical practitioner is well paid for his skill, his time and his assistance during pregnancy and labour by a fee far lower than would be paid for a minor operation of general surgery.

“ Her last doctor took away the baby in a couple of hours,” says the patient’s mother indignantly. “ My last doctor did not make all this fuss,” says the patient herself. “ Her last doctor only charged three guineas,” says the husband.

It is popular to speak and to write as if medical science sprang yearly from one step to another, and that each step formed a permanent and desirable advance towards the top storey of knowledge. This may be so in medicine, but it is not the case in the art of midwifery.

It is now just thirty years since the first edition of my small book on midwifery was published. It contained the teachings of Sir William Smyly, and the statistics of the Rotunda Hospital during his Mastership, and during the first year of Dr. Purefoy’s. It is of interest to note their treatment of the major complications of pregnancy and labour—sepsis, hæmorrhages, eclampsia—and to examine their results.

The aseptic technique of Sir William Smyly was far ahead of that of the average private hospital of the present day. The treatment of puerperal infection was no more unsatisfactory. The treatment of the hæmorrhages of pregnancy and labour was identical with that which is now generally accepted, although at the time students were threatened with rejection at their examinations if

they mentioned it ! The treatment of eclampsia had not been placed on the firmer basis on which Tweedy and Stroganoff have since placed it, but it was superior to that too often adopted to-day in private practice.

As for the general results the following figures will show them. During the five years ending 1898, 7,068 women were confined in the hospital. The total mortality was twenty-two, that is at the rate of 3.1 per thousand including abortions.

Candidly, if we exclude the recognition of the necessity for a more rigid aseptic technique, I do not know of any very marked advance since the time to which I allude except the introduction of antenatal care. This obviously implies the recognition of the eternal principle that prevention is better than cure. I am, however, referring more to methods than to principles. The method of preventing some of the factors, which help to cause pulmonary embolus, has probably been recognised. This is all to the good. On the other hand, pubiotomy, and especially prophylactic pubiotomy, has been decried. Cæsarean section is rampant. Internal pelvimetry is seldom practised. The art of obstetrics is replaced by badly assimilated surgery. The *general* practice of asepsis is but slightly improved. These things are all to the bad.

If we compare the bad and the good, I cannot testify that the "forward march of progress" is evident.

I think we run after methods—principally operative methods—and neglect men and women. We

are eternally looking for new advances—advances that must be built on knowledge, and neglecting the foundation on which that knowledge must be built. We create hospitals which make interference with normal labour easy, and we neglect the essentials which make interference safe, and the teaching which makes it unnecessary. We make medical practitioners and midwives, but we fail to provide them with a sufficient knowledge of midwifery. We wrangle over responsibility and the obvious, until the latter is lost in a cloud of words. We attempt the impossible, and we wonder why our efforts are resultless. During all this the complications of pregnancy cause unnecessary deaths, and the septic factor assumes a higher value.

The object of this book is to try to bring into prominence basic principles which must be turned into practice before we can hope for better things. Occasionally I wander from principles to details, when it seems that details are necessary. I hope that I, too, am not attempting the impossible. If I have done so, perhaps what I write may help some one else to write in a more effective manner.

CHAPTER II

THE CARE OF THE PREGNANT WOMAN

THERE are four classes of people who may be responsible, either in part or in whole, for the care of the pregnant woman, that is of the woman from the beginning of pregnancy to the end of the puerperium. These are (*a*) the maternity nurse, (*b*) the midwife, (*c*) the general practitioner, and (*d*) the obstetrical specialist. The maternity nurse is responsible solely for the nursing of the patient during labour and the puerperium, under the directions of either a general practitioner or specialist. The midwife is responsible for advising the normal patient during pregnancy, and for her entire care during labour and the puerperium so long as these remain normal. The general practitioner's responsibility is similar, save that he is also responsible for the care of abnormal cases, and for coming to the assistance of the midwife when necessary. The specialist's responsibility is again similar to that of the general practitioner, with the added responsibility of coming to the assistance of the latter when necessary.

A pregnant woman can thus choose between three different forms of assistance :—

(1) A midwife, behind whom in case of abnormality stands the general practitioner and the specialist.

(2) A maternity nurse and a general practitioner, behind whom stands the specialist.

(3) A maternity nurse and a specialist.

Which of these three classes offers the pregnant woman the best prospect of obtaining the benefits of midwifery, that is to say a normal pregnancy, labour and puerperium, a healthy infant, and unimpaired future health ?

Before answering the question, I am going to make certain statements which I propose to regard as matters of fact.

It is essential that a woman shall receive competent advice and supervision during pregnancy in order that any abnormality or disease, whether of herself or of the ovum, shall be detected at the earliest moment, and get the necessary treatment under the most favourable conditions.

A healthy woman, who comes into labour with an assured freedom from all abnormalities, will deliver herself most safely without any assistance, but from the point of view of her bodily and mental comfort, the presence of a nurse is essential. A similar statement may be made regarding the puerperium.

A woman in ill-health, or in whom there is any abnormality affecting or likely to affect the course of labour, or in whom the absence of such conditions has not been previously determined, requires skilled attention throughout. The extent of the complication present prescribes the degree of skill necessary. When it is severe the greatest skill available is essential.

I may put the foregoing in a slightly different

manner. It is probable that at least eighty-five per cent. of women could pass through pregnancy, and deliver themselves most safely with the assistance of a nurse alone. It is probable that another ten per cent. would suffer materially from the absence of medical assistance. It is probable that some of the remaining five per cent. would die for want of it. If the assistance she gets is not sufficiently skilled, serious consequences may result.

To the eighty-five per cent. medical assistance being unnecessary brings in a possible danger—the danger of infection. To the remaining fifteen per cent. it brings an essential relief. If it was possible to allocate patients definitely to one or other group, and then to treat them accordingly, it would go a long way towards reducing maternal mortality. Unfortunately it is not possible, and so, for the benefit of those who fall into the second and third groups, medical assistance must be available. This does not mean that in all cases medical assistance must be present. The midwife has been trained to undertake the care of normal patients, and so, following the lines of the rough classification I have adopted above, she is available for managing eighty-five per cent. of patients.

Assuming then that a midwife, or a medical practitioner of either general or specialist rank, must be responsible for every patient during pregnancy, and assuming that both are equally well trained to discharge their respective duties, which of them is the most desirable?

If a midwife is responsible for the care of the

woman during pregnancy she must be able to treat the minor ailments thereof, to recognise the early symptoms of disease, and to exclude the presence of maternal or ovular abnormalities. If she can do these three things, there does not seem to be any reason why she should not look after the normal pregnant woman, but, in order that it may be certain that the woman and her pregnancy are normal, it is necessary that each woman should be medically examined early in pregnancy.

The choice, between a general practitioner and a specialist, in practice depends largely on the circumstances and inclination of the patient. Actually, it should more largely depend on the nature of the case, and on the willingness of the general practitioner to obtain additional assistance in conditions which limitation of obstetrical education or of experience place beyond his powers.

I am inclined to suggest that a correct standard of midwifery practice during pregnancy is reached when, after a preliminary medical examination, the care of the normal woman is entrusted to a midwife who is capable of recognising when she must get medical advice. Further, that such assistance can usually be safely and satisfactorily supplied by a general practitioner who can in turn be trusted to seek for the aid of the specialist when it is necessary. On the other hand, every woman, who is the subject of disease or abnormality, must remain under medical care.

The best method of supplying the care of the woman during labour is a more vexed question, and it

is probable that my views thereon may not meet with general acceptance. I think that, from the point of view of the individual patient, the most suitable person to look after her is either a midwife or an obstetrical specialist. There are several reasons for so thinking. In the first place both of them can give, or ought to be able to give, the necessary time, and ought not to be driven by the urgencies of practice to shorten the labour to the injury of the patient. For the midwife it is, or ought to be, a matter of one patient at the time. For the specialist his fee is, or should be, sufficient to enable him to give all the time that is required.

The position of the general practitioner is different. In the day time, the demands of general practice press on him as well as those of midwifery. At night, he must get some time for sleep if he is to carry on his work. The natural, and perhaps the unavoidable, consequence is that he usually comes to a midwifery case in a hurry, and that the two essentials of midwifery—asepsis and the avoidance of interference—are crowded out. Again, he is in constant contact with infections of different kinds, and no matter how careful he may be to remove the results of it, it is not always possible to do so. The midwife has neither the need nor the right to come into contact with infection; while, if the specialist does so in the course of gynæcological practice, he can find a substitute to replace him temporarily. Lastly, the obstetrical knowledge of the general practitioner is in most cases inferior to that of the specialist.

I hope that no one will accuse me of trying to decry the general practitioner, for it is the last thing which I wish to do. I am trying to consider the question dispassionately, and solely in the light of things as they are, and such consideration leads me to the opinion I have expressed. There is no question of fault or of superiority. A general practitioner must of necessity be hurried, and he may, again of necessity, carry infection. He cannot be a specialist in all things. An obstetrical specialist, on the other hand, can give his patient the necessary time; he can avoid personal infection, and, if his knowledge is not greater than that of the average general practitioner, he has no right to call himself a specialist.

I am aware that it has been denied that there is a greater tendency to septic infection in cases attended by medical men than in those attended by midwives. The report of the special committee set up by the British Medical Association on Puerperal Mortality and Morbidity, a report from which I shall quote later in regard to other matters, states (*Brit. Med. Journ.*, April 28th, 1928) that the contention in the report by Dame Janet Campbell on "Maternal Mortality" (Ministry of Health, London, 1924), "that 'the average death rate among midwives' cases is certainly lower than that amongst doctors' cases,' is clearly not borne out by the figures of the puerperal sepsis factor in doctors' and midwives' cases as set forth in the table on page 110 of the report, where the percentage is higher in midwives' than in doctors' cases."

The total number of cases of septic infection quoted in the table is only 256, still, even assuming that the ratio shown there applies generally, I think it only proves that the present education of midwives in aseptic practice is insufficient. My point, however, is that, given efficient education, the probability of a midwife carrying infection to a patient is necessarily less than in the case of a medical practitioner. I have already explained why I think so, and I only add that I do not know of any practical means by which a medical practitioner in busy general practice can pass from a case of acute infection to a midwifery case with hands that are certainly free from infection. He can wash them, use antiseptics, and wear gloves, but he cannot guarantee asepsis, and the infection he carries may be virulent. The midwife, on the other hand, can be prevented from going from a case of infection to another patient. If in practice she is not prevented, that is a matter for administrative reform. I do not see any way in which such reform can affect the practitioner, because the cases of infection he sees in his daily work are too numerous.

The statistics of the East End Maternity Hospital, London, are, I think, in point. Amongst 47,000 patients confined under the care of the Institution there was one death from sepsis. The ordinary work of the hospital is in the hands of midwives, and the medical aid necessary is provided by a medical practitioner of special experience. Further, amongst 317,758 women confined under the care of the Queen Victoria Jubilee Institute, there were 106

deaths from sepsis, a rate of 0·33 per 1,000 births. The general rate for Holland during the same period, *i.e.*, six years ending 1927, was 0·77 per 1,000 live births, for Denmark (five years) 0·95 per 1,000, for Norway (three years) 0·71 per 1,000. In these countries the normal woman is attended by a midwife. On the other hand, the general septic rate for England and Wales for the same period was 1·46 per 1,000, for New Zealand 1·82, for Scotland 1·82, for the Irish Free State (four years) 1·79, for Australia 1·70. In these countries the normal woman is usually attended by a medical practitioner.

So far then my argument suggests that, if a specialist is not available, a midwife is the next best choice. Before deciding the matter, however, there is another point to consider. Has the midwife, as a class, the necessary knowledge to enable her to decide when it is necessary to send for medical assistance? In regard to the more obvious complications of labour, there is, of course, no doubt as to the answer. Any midwife can recognise hæmorrhage, convulsions, œdematous legs, and so forth, but can *all* midwives recognise contracted pelvis, tumours, malpresentation of the head at a sufficiently early stage to enable them to get the treatment of election? If not, then a woman may come into labour and remain in labour until symptoms of undue delay draw attention to her condition, when it is too late to give the complication anything but the treatment of compulsion.

On the other hand, is the woman under the care of a general practitioner always better off? Are there

not plenty of instances in which a general practitioner books a patient and does not see her again, perhaps through the fault of the patient herself, until the maternity nurse sends to say that it is getting near the end of the second stage ? If the case is a normal one, the patient has lost nothing by his absence, but if it is not, she is no better off than if she had been attended by a midwife.

The whole question must be looked at from two aspects. The one—the patient's—is all important to everyone. The other—the medical practitioner's—is sufficiently important to himself. For myself, I hold that the interests of patient and practitioner are identical under present conditions.

If the practitioner received for midwifery a fee which was in accord with the time he ought to devote to the case and to the knowledge he ought to bring to it, the respective interests of patient and practitioner might differ. As things are, however, the usual fee is absurd, and so I hold their interests to be identical.

What are these interests ?

It is the vital interest of the normal patient to be saved from three things—interference, undue haste, and sepsis. It is the vital interest of the medical practitioner to be freed from the body and soul destroying business of an excessive midwifery practice. I think that the statistics I have given apparently prove that the septic death rate of maternal mortality can be halved by handing over normal labours to midwives. That the general death rate is also considerably lower, can be

seen from the statistics given later. If these statistics are right, it is unnecessary to discuss further what are the interests of the patient. They are obvious.

I think, too, I am right in regard to the practitioner, in so far as his mental and bodily interests are concerned. His financial interests, however, must also be taken into consideration. Will the handing over of normal patients to midwives seriously reduce his income.

I understand that the main reason why a medical practitioner desires to have a large midwifery practice is not so much the direct income it brings as the indirect. Just as the Jesuit says—"Give me control of the children during a susceptible age, and the rest will follow," so the practitioner says—"Give me control of the mother during a susceptible stage, and the whole family will follow." The argument is quite correct. If an individual practitioner refuses to attend a case of midwifery, his neighbour, who does not refuse, will become the family physician. But, if the medical profession as a whole refused to attend midwifery cases except at a commensurate fee, midwives would be generally employed, and the post of family physician would still be open. Moreover, a practitioner's services are, and always will be, wanted for ante-natal diagnosis and care, abnormal pregnancy and labour, post-natal diagnosis and care. Is it possible that he can receive a less sum for these services properly carried out at his own convenience than he does now for hastily conducted labours, to the burden of

which public opinion is compelling him to add the additional burden of ante-natal care without, I fancy, an increased fee.

It may seem that I am trespassing on the domain of medical politics, but, if so, it is because the relations of a medical practitioner to the pregnant woman are so vitally bound up with maternal mortality and morbidity.

I urge the consideration of these views by the profession generally. They have good support behind them.

Fairbairn has given his opinion that "the ideal is to have a midwife in charge of normal labour with a doctor available for emergencies."

Sydney Morris, Senior Medical Officer, Department of Health, New South Wales, writes: "Provided that the woman can obtain the services of a competent midwife for the actual confinement and the puerperium, together with the advice and supervision of a careful practitioner during the later months of pregnancy and in any emergency during the actual labour, most other conditions may be considered as relatively unimportant."

The Ministry of Health in Great Britain, through the mouthpiece of Dame Janet Campbell, referring to an appropriate way of creating a satisfactory maternity service, states: "Such a service might well be based on a scheme for improved domiciliary midwifery in which many normal deliveries and all maternity nursing would be performed by midwives, but always with the active support of the patient's own doctor, who would be responsible for

ante-natal supervision, for the conduct of normal labour if so desired, for the treatment of any complication arising in the course of pregnancy or childbirth, and the over-sight of the lying-in period, together with the care of the infant."

The report of the special committee set up by the British Medical Association to consider puerperal morbidity and mortality has reported as follows:—"Its utility" (*i.e.*, ante-natal work) "might be carried still further by a classification of cases into those which are normal and those which are abnormal, allocating the former to the midwife, whose function it is to attend normal cases, and the latter for the supervision of the medical practitioner."

Finally, in a leading article in the *British Medical Journal*, May 31st, 1924, on the report of the Departmental Committee on Puerperal Morbidity and Mortality appointed by the Scottish Board of Health, the following appears:—

If the view of the Scottish Committee, that the services of the trained midwife and the doctor are complementary, is accepted, it will be clear that the charge of normal labour will in future be more and more transferred to the midwife, the duties of the medical practitioner being rather those of ante-natal examination, passing the patients as normal, and exercising a general supervision. The lengthening of the period of training, now under consideration by the Central Midwives Board, will enable the midwife to take an increasing share in the maternity service. The practitioner may thus be relieved of as much of the most trying part of his work and the

greatest tax on his time as the demands of his patients—who pay the piper and call the tune—will allow. These proposals, then, must be judged, not in the light of midwifery practice as it has been, but in view of the changes that are coming about in it.”

Many others have said or thought the same thing.

It seems to me that there is at the present time an extraordinary opportunity of helping maternity, of raising the public repute of the medical profession, and of benefiting the bodies and minds of an over-worked profession. We can get rid of the fetish which insists on the attendance of a medical practitioner at all labours to the detriment of the patient and the practitioner. We can substitute for it a proper system of ante-natal service, intra-natal assistance when necessary, post-natal care, all of which are now so largely lacking. The loss of professional income, which such a change would cause, is, I suggest, very small, and one for which there would be ample compensation in the increased capacity of the practitioner for other work. The change is bound to come sooner or later, and it is preferable that it should come through the agency and with the support of the medical profession.

I cannot help thinking that, when such a change of practice does come, the average medical practitioner will wonder how the practitioner of the past put up with a system which turned his night into day, his professional work into toil, and his obstetrical conscience into a nightmare.

For whose aid should a midwife send when

necessary—general practitioner or specialist? Undoubtedly if a specialist is available he is the more suitable, but, in the majority of cases, financial considerations, or the impossibility of obtaining a specialist intervenes, and a general practitioner is the necessary choice.

There is a final stage in the management of the pregnant woman, and it comes immediately the actual “lying-in” is over, that is to say about the fourteenth day to the twenty-first day of the puerperium. At this time it is essential to examine every patient to find out if the uterus is involuting satisfactorily, if it is in a normal position, and if there are any injuries of labour that call for early attention.

For this stage the services of a medical practitioner are essential, and necessarily of one who has had experience of gynæcological diagnosis and treatment.

The trend then of what I have written is as follows : A well-taught midwife, with medical help at her back, is, next to an obstetrical specialist, the most suitable person to assume the care of a woman throughout normal pregnancy and labour, subject to the following limitations :—

(1) Every woman must be examined by a medical practitioner, firstly, during early pregnancy, and secondly, as near to the date of labour as is possible.

(2) Every woman ought to be examined, between the fourteenth and the twentieth days of the puerperium, by a medical practitioner who understands gynæcological diagnosis and treatment.

Statistics support this view, as is shown by the following figures :

Country.	No. of Births.	Death-rate per 1,000 Live Births.
British Empire (part of) ¹ .	6,050,532	4·22
Holland and the Scandinavian countries.	2,064,526	2·53

¹ England and Wales, Ireland (North and South), Scotland, New Zealand, Australia.

In the parts of the British Empire given above almost all women are confined by medical practitioners. In Holland and the Scandinavian countries they are confined by midwives.

It is well to give these figures due consideration. To me they seem clearly to suggest that the absence of haste in the conduct of labour, and of possible infection, more than compensates for the lower degree of skill which the midwife must possess.

In deciding this point, however, we must also attach due value to the fact that, in Holland and the Scandinavian countries at all events, the midwife has at her command a body of medical practitioners who are far more highly trained in midwifery than are the practitioners of the British Empire as a whole. Further, that these practitioners have behind them a considerable number of highly trained specialists.

It will be of interest to state here the system adopted in Holland for the care of the pregnant and

lying-in woman. I understand that the system followed by the Scandinavian countries is very similar. The Dutch system is shortly as follows :—

(1) Every woman is seen by a medical practitioner during her pregnancy.

(2) Nearly every woman is attended during labour by a midwife without a medical practitioner, so long as the labour remains normal.

(3) Every woman can, and does get medical aid if her labour becomes abnormal, and the midwife is compelled by law to obtain it.

(4) The midwife is replaced during the puerperium by the assistant midwife, who is not allowed to undertake domestic duties.

(5) A medical practitioner does not attend the patient during the puerperium unless the latter is abnormal.

It will be seen later that the system which I suggest as an ideal is very similar to this (*v. Chap. IX.*).

I pass on now to consider in greater detail the duties during pregnancy and labour of the four classes of those whom I may group together as “obstetrical attendants,” during pregnancy and labour. These classes are :—

(1) The maternity nurse attending in conjunction with a medical practitioner.

(2) The midwife, attending alone.

(3) The general practitioner.

(4) The obstetrical specialist.

(1) The maternity nurse attending with a medical practitioner, has certain well-defined duties, and they begin as soon as she is engaged by the patient.

Her first advice should be to engage at once a medical attendant, if this has not been done, and to report to him for advice and examination. Her next duty is to create in the patient's mind an impression of the vital necessity for regular reports or visits to her medical adviser during the whole of pregnancy. Her third duty is to keep in touch with her patient during pregnancy, to advise her regarding minor ailments that are more the result of ignorance than of ill-health, and to acquaint the medical practitioner with any untoward symptoms or failure to carry out instructions on the part of the patient.

These duties done, she can pass on to nursing matters, and can give the necessary instructions and advice relating to the various articles required for labour and the puerperium, the infant's clothes, the necessary alterations in her patient's dress, and, later, the preparation of the room in which the labour is to take place. Finally, she warns the patient to send for her the moment the premonitory symptoms of labour appear, and at the same time to report the fact to her medical adviser.

When labour starts she comes into residence in the patient's house, and her more active duties begin, the first of which are the final preparation of the labour room and of the various appliances necessary. Her function during labour is, or should be, that of a nurse, and, as in the case of any other type of nurse, it includes keeping a careful watch on the condition of the patient. On the other hand, it is not, and should not be made, her function to assume any responsibility for the original diagnosis of the

normality or abnormality of the labour, nor should she be allowed or compelled to make vaginal examinations. It is obvious that, if a medical practitioner is engaged to attend a patient, his most important duty is exact and early diagnosis. I shall elaborate this point in a moment.

During the puerperium ordinary nursing duties predominate, with the addition of the special duties imposed by the onset of lactation and the care of the infant.

The midwife, attending alone, is responsible for the discharge of all the duties that belong to the maternity nurse, and also for the treatment and management of the patient for so long, and only for so long, as the condition of the latter remains normal. During pregnancy, she treats minor ailments and watches for the possible onset of any illness. She advises in regard to diet, personal hygiene, exercise, and dress, and, in short, does all that she can do to bring the patient to labour as a normal and healthy woman. Should illness or other complications supervene and necessitate medical advice or attendance, she becomes once more a maternity nurse whose first duty is to carry out medical orders.

During labour, the midwife is wholly responsible for diagnosis, and for the general conduct of the normal case. Should any complications appear, her first duty is to send for medical assistance, and, while waiting for it, to carry out such treatment as she can. During the puerperium, her responsibilities and duties are similar.

The functions of the general practitioner and of

the specialist are so similar that it is unnecessary to consider them separately. In general terms they consist in assuming all responsibility for the general management of the patient during pregnancy, labour, and the puerperium, including the details of asepsis and the manner in which the nurse discharges her duties.

During pregnancy, he is responsible for advice and diagnosis in every case, and for treatment when such is necessary. During labour, again his first duty is diagnosis, followed when necessary by treatment. His other duties are the giving of mental help, the relief of physical suffering, the normal delivery of a normal child, and the avoidance of all interference that is not wholly unavoidable.

His *first* duty is, I repeat, diagnosis—both in point of time and in point of importance. Accurate diagnosis, that recognises complications in their earliest stages when they can be readily overcome or treated by the method of choice, is the chief way in which he can compensate for the fact that his presence brings an added risk to the normal case. The practitioner, whether general or special, who first sees his patient, during labour, when the head is on the perinæum, is depriving her of the main safety that his attendance should have provided. During the actual birth of the child he may be a mental comfort, a pain-reliever, and sometimes an assistance, but, during the early stages of labour when the diagnosis between normality and abnormality is wanted, he is an essential. If his time is so occupied that it is impossible for him to give

all the attention he wants, he should complete his diagnosis and then, if the case is normal, leave the rest of its management to the midwife.

I am afraid the opposite practice is much more common, and that the fatal consequences that follow it are not few.

There are exceptions to every rule. If the medical adviser has seen his patient in the last few days of pregnancy, if the foetal head is fixed, and his preliminary examination has proved the absence of abnormality, further examination during the first stage is not essential. If, on the other hand, he has not seen her for some weeks, and if, as in a multipara, the presenting part is still free above the brim, then his visit in the early part of the first stage becomes the most important part of his duties.

There are other duties too. The responsibility for the aseptic technique is his, although circumstances usually compel him to delegate its details to the nurse. Too many medical practitioners are inclined to throw both details and responsibility on the latter, to accept unquestioningly whatever she may chose to give, and blindly to regard it as sufficient. This works to the prejudice of midwifery in two ways: it exposes patients to greater risks, and it deprives the nurse of the instruction and advice she might otherwise have received. It must not be forgotten that numbers of nurses, who are still in active practice, have never received efficient training in asepsis, that others have forgotten what they once learnt, and that others may be weak enough to be overwhelmed by the adverse criticism

of the patient or her relations. It is an essential part of the duties of the conscientious practitioner to educate, or re-educate, these women to a modern standard, and until practitioners do so there is very little hope of improving present conditions. An Adam-like attitude—the woman gave me and I took it—towards the appliances proffered during labour by a nurse whose aseptic conscience is astray, can only close one of the channels which lead to a reduced mortality.

I have suggested that the duties and functions of a general practitioner and a specialist are similar. This is so, but the responsibilities of the specialist are greater, because he has, or should have, greater knowledge at his disposal with which to discharge them. A well-trained obstetrical specialist is a most valuable asset in any town or district. A practitioner who poses as a specialist without the necessary preliminary training, is a cause of misplaced confidence and a danger.

Too many men confuse the postgraduate course of general practitioners with the prolonged training of the specialist, and are prone to think that because they have had such a course they have become automatically specialists. The practice though lawful is certainly not expedient, so far as the public is concerned, and doubtless will lead some day to its own definite repression.

To anyone who wants to turn from general practice to midwifery, I would say—Do so by all means. A practitioner who practises nothing but midwifery is a most useful member of the medical

profession, because he will be able to give his patients the necessary time, and to avoid many of the ordinary sources of infection. Let him not, however, call himself a specialist until years of experience allow him to do so justifiably, or to hesitate to call a specialist to his assistance when necessary, should such a one be available.

CHAPTER III

THE EDUCATION OF THE MATERNITY NURSE AND MIDWIFE

THE brief outline given in the last chapter shows the general lines of the duties of midwives and maternity nurses. The former must be competent to advise on the management of normal pregnancy, to diagnose normality and abnormality, to conduct normal labour, and to nurse. The latter must be competent to recognise unfavourable symptoms, and to nurse. It is also very advisable that she should be able to conduct a case of normal labour in the absence of the medical practitioner. Both midwife and maternity nurse must be so imbued with the principles of asepsis that its practice has become second nature.

I think I shall give a good general idea of the systems of training in existence in the British Empire if I reproduce here, firstly, the requirements of the Nurses and Midwives Registration Board for New Zealand, which may be regarded as a fairly progressive body, and, secondly, the requirements of the Central Midwives Board of England and Wales, which may be regarded as a fairly conservative body.

The course prescribed by the New Zealand Board is as follows :

Preliminary Conditions.—Each class of nurses

must be trained in a recognised hospital, the matron of which must be, (a) specially qualified for the training of midwives or maternity nurses as the case may be, and (b) approved by the Board.

Instructional Course. — The instructional course for maternity nurses shall include the following subjects, which, whenever possible, shall be taught both practically and theoretically: The ethics of nursing; the duties of a maternity nurse; the elementary anatomy of the female pelvis and generative organs; the principles of asepsis and antisepsis; antiseptics in midwifery, and the way to prepare and use them; the management and aseptic technique of labour and the puerperium (*v.* Chapter VII.); methods of preventing the spread of infection (*v.* Chapter V.); the general principles of maternity nursing; the management of normal pregnancy; the principal complications of pregnancy, including abortion; obstetrical diagnosis, including abdominal palpation and rectal examination; the symptoms, mechanism and course of normal labour; the management of normal labour; the principal complications of labour; the signs that labour is abnormal; drugs used in midwifery and their dosage; the administration of anæsthetics to the obstetrical degree; the symptoms and course of the puerperium; the management of the puerperium; the principal complications of the puerperium; the taking and recording of temperature, pulse and respiration; catheterisation and urine testing; the duties of the nurse in obstetrical emergencies; the preparation of the patient and

the room for labour, and for an obstetrical operation ; the management of infants, premature and full term ; infant-feeding, natural and artificial ; infantile disorders ; asphyxia of the newly born ; the elements of house sanitation ; the cooking and preparation of food ; ante-natal diagnosis and treatment ; general nursing : baths, packs, hypodermic injections, sub-cutaneous and rectal salines, enemata, douching, treatment of collapse, measuring of medicines, lavage of rectum, serving of meals.

The instructional course for midwives shall include more extensive instruction in all the subjects laid down for maternity nurses, with the addition of the following : The duties of a midwife ; vaginal examination ; the prognosis of labour ; the conduction of labour.

Lectures.—It is advisable that every four months a course of sixteen lectures should be given by one medical practitioner, and a course of thirty-two lectures, or two courses of sixteen lectures each, by a registered nurse and midwife recognised as a teacher. The registered medical and surgical nurse qualifying for the certificate of maternity nurse will attend twenty-four lectures by a medical practitioner and forty-eight lectures by a registered nurse and midwife. The unregistered woman qualifying for the certificate of maternity nurse will attend forty-eight lectures by a medical practitioner, and ninety-six lectures by a registered nurse and midwife. The registered medical and surgical nurse qualifying for the certificate of midwife will attend thirty-two lectures by a medical practitioner and sixty-four

lectures by a registered nurse and midwife. The maternity nurse qualifying for the certificate of midwife will attend sixteen lectures by a medical practitioner and thirty-two lectures by a registered nurse and midwife.

Practical Work.—It is necessary to make use of every opportunity which the training hospital affords of giving pupils practical work and practical instruction. The following table shows the minimum requirements laid down by the Nurses and Midwives Registration Board in the subjects mentioned :

Subject.	Class 1.	Class 2.	Class 3.	Class 4.
Assistance at labour ¹ . . .	20	40	30	20
Conduction of Labour . . .	5	5	20	20
Abdominal palpation (ante-natal and labour patients) . .	30	60	40	30
Vaginal examination . . .	—	—	30 to 40	30 to 40
Rectal examination . . .	30	40	30	20
Ante-natal patients examined ² .	{ New patients Old patients		20 40	20 40
Labour patients prepared . .	20	40	20	15
Obstetrical anæsthesias given .	10	15	15	5
Puerperal patients nursed ¹ . .	20	40	30	10
Infants nursed . . .	20	40	30	10
Catheterisations . . .	} As opportunity occurs.			
Vaginal douches . . .				
Preparation of sterile dressings, appliances, etc., as prescribed by the Board . . .	2	6	3	2

¹ Not more than two nurses may be given credit for assistance at the same labour, or for nursing the same lying-in patient.

² Whenever possible it is advisable that the maternity nurse in training shall receive instruction in ante-natal diagnosis and treatment.

Class 1.—Registered nurse qualifying as maternity nurse.

Class 2.—Unregistered woman qualifying as maternity nurse.

Class 3.—Registered nurse qualifying as midwife.

Class 4.—Maternity nurse qualifying as midwife.

Each pupil shall keep a record of the work she has done and has seen during her training. Such record shall be kept in the "Obstetrical Case Book" issued by the Board. This book shall be brought weekly to the Matron or Sister-in-charge, who shall examine and, if necessary, correct the entries made, and help the pupil to keep her records correctly. Each pupil shall produce the book at her examination for inspection by the examiner, who shall take its contents into consideration when allotting his marks.

Each pupil, when nursing a lying-in woman, shall also nurse her infant.

Certification.—The onus of certifying that the pupil has received her proper course of training is thrown on the medical officer of the hospital and the matron, who have jointly to sign the following certificate :—

Hospital

Date

We hereby jointly certify that
has completed the prescribed period of training at this hospital, and that during this time she has received the full course of practical and theoretical instruction prescribed for { Maternity Nurses } in
Midwives }
the instructions issued by the Nurses and Midwives Registration Board.

Her record of practical work includes the following :—

<i>Subject</i>	<i>Number of Cases</i>
Attendance at labours.	
Conductions of labours. ¹	
Abdominal palpation	<div> <div></div> <div> </div> </div>
Vaginal examinations. ¹	
Rectal examinations.	
Vaginal douches. ¹	
Ante-natal patients examined.	
Labour patients prepared.	
Obstetrical anæsthesia.	
Puerperal patients nursed. ²	
Infants nursed. ²	
Catheterisations.	
Preparations of sterile dressings, appliances, etc., as prescribed by the Board.	
Signatures	Medical Officer. Matron.

¹ For midwives only.² Only patients or infants whom the candidate has nursed for ten days or more may be included in these figures.

The course prescribed by the Central Midwives Board of England and Wales is as follows :—

“ The pupil must, to the satisfaction of the person certifying, have

“ (a) Examined and received instruction in the supervision of not less than twenty pregnant women (including booking and keeping of records).

“ (b) Witnessed not fewer than ten labours, and in addition attended and watched the progress of not fewer than twenty labours, making abdominal

and vaginal examinations during the course of labour and personally delivering the patient. Of the twenty patients personally delivered, the first five must be attended within an institution, where there is a training school approved by the Board, and of the remaining fifteen at least five must be attended in their own homes.

“(c) Nursed twenty lying-in women and their infants during the ten days following labour. Of these at least five women must have been nursed in their own homes.

“(d) During the period of training, attended a course of not less than thirty lectures on the subjects prescribed for examination, extending over a period of not less than four months, and delivered by a registered medical practitioner or practitioners, recognised by the Board as lecturers.

“The certificates required by the above rule, other than the certificate of having attended a course of lectures, must be in the form prescribed by the Central Midwives Board, and must be filled up and signed either

“(a) By a registered medical practitioner approved by the Board for the purpose ; or

“(b) By the chief midwife, or, in the absence of such an officer, by the matron of an institution recognised by the Board, being a midwife certified under the Midwives Act ; or

“(c) By a midwife certified under the Midwives Act, and approved by the Board for the purpose.

“The certificate of having attended a course of

lectures must be in the form prescribed by the Central Midwives Board, and signed by the person or persons who delivered the course of lectures.

“The examination shall be partly oral and practical, and partly written, and shall embrace the following subjects :—

“(a) Elementary genital physiology, and the principles of hygiene and sanitation as regards home, food, and person.

“(b) The causes of infection and its prevention ; antiseptics in midwifery and the way to prepare and use them ; the disinfection of the person, clothing, and appliances.

“(c) The elementary anatomy and physiology of the female pelvis and its organs and of the breasts.

“(d) The physiology, diagnosis and management of normal pregnancy, the hygiene and care of the pregnant woman and the unborn child, including the examination of the urine.

“(e) The signs and symptoms of abnormal pregnancy.

“(f) The physiology, mechanism and management of normal labour.

“(g) The signs that a labour is abnormal.

“(h) The physiology and management of the puerperium, including the taking and recording of the pulse and temperature and the use of the catheter.

“(i) Hæmorrhage complicating pregnancy, labour and the puerperium.

“(j) Complications of the puerperium includ-

ing puerperal fevers, their nature, causes and symptoms.

“(k) Obstetric emergencies and their management by the midwife until the arrival of the doctor.

“(l) The hygiene and management (including breast and artificial feeding) of infants up to one month old.

“(m) The care of the breasts under both normal and pathological conditions.

“(n) The care of children born apparently lifeless, and the management of premature and weakly children.¹

“(o) Signs of the diseases which may develop during the first month after birth, with special reference to ophthalmia neonatorum and the responsibilities of the midwife in connection therewith, and to skin eruptions, with special reference to pemphigus.¹

“(p) The venereal diseases (syphilis and gonorrhœa) in women and infants, their signs, symptoms, and dangers and the risk of contagion.¹

“(q) The use of such drugs and solutions as may be required in practice ; the conditions which call for their use ; the mode of their administration or application ; and their dangers.

“(r) The duties of the midwife as described in the regulations, including the proper manner of keeping

¹ *Note.*—It is desirable that wherever possible arrangements should be made for pupil midwives to (1) visit ophthalmic hospitals, or the ophthalmic departments of general hospitals, for the purpose of gaining direct experience of ophthalmia neonatorum. (2) Observe cases of puerperal fever at hospitals or elsewhere. (3) Observe cases of venereal disease at a V.D. clinic. (4) Attend infant clinics.

the register, keeping records, filling in forms and co-operating with health agencies."

The main differences between the New Zealand and the English courses are thus as follows :—

(1) In New Zealand, the pupil must take her entire training in an approved hospital. In England, five conductions must be taken in an institution approved by the Board. The remainder of her training may be given by a recognised midwife and medical practitioner.

(2) In New Zealand, a more definite instructional course is prescribed.

(3) In New Zealand, all the minimum essentials of practical training are fixed. In England, only the details of attendances of ante-natal clinics, labour, and the lying-in.

(4) In New Zealand, all the lectures attended by a nurse must be given by one medical practitioner. In England, they may be given by one or more practitioners.

Accordingly, while in New Zealand there is a uniform standard of training for the whole country, and such training must be taken in an approved hospital, in England there is no uniform standard, and the only hospital, or rather institutional, training a nurse must receive is while she is actually attending five conductions.

On the other hand, the regulation that prescribes that a pupil must conduct and nurse at least five women in their own homes is excellent. So too, if it is carried into effect, is the statement that it is desirable that pupils should visit in the course of their training ophthalmic hospitals, hospitals where

puerperal fever can be studied, and venereal and infant clinics.

(5) In New Zealand, a single standard of aseptic technique is taught throughout the country. In England, the standard of asepsis is left to the individual teachers, some of whom are merely practising midwives who may or may not themselves have grasped the principles and practice of asepsis.

The foregoing will probably suggest a number of questions :—

(1) What is the difference between a maternity nurse and a midwife ?

(2) Why are two classes of nurses recognised in New Zealand ?

(3) Is it advisable to allow a woman who has not received general training to become (a) a maternity nurse ; (b) a midwife ?

(4) Is the course of training for each class of nurse sufficient in either New Zealand or in England ?

I will try to answer them.

(1) *What is the difference between a maternity nurse and a midwife ?* I have already answered this question, still it may be convenient to repeat the answer here. A maternity nurse is a woman who has received sufficient training to fit her to nurse women during labour and the puerperium, under the supervision of a registered medical practitioner ; to enable her to recognise the normal course of labour and the puerperium, and the onset of abnormal symptoms ; and to make her appreciate the necessity for asepsis, and practise it. A midwife is a woman who has received similar instruction, but

who in addition has received sufficient further instruction to enable her to carry out the ante-natal care of the normal woman ; to recognise the various complications of pregnancy, labour, and the puerperium ; and to conduct by herself cases of normal labour.

(2) *Why are two classes of nurse recognised?* This has been done for the following reasons :

(a) Because it is felt that a number of women can be trained to make quite good maternity nurses, who are not suitable to become midwives, and because such nurses are wanted. (b) Because women, with a higher training than is necessary for the maternity nurse, are wanted as staff nurses, sisters, and matrons in public and private maternity hospitals, and especially in those public hospitals which are recognised as training schools. (c) To provide practising midwives for districts in which medical assistance is difficult to obtain.

(3) *Is it advisable to allow women who have not received general training to become maternity nurses and midwives?* The obvious answer to this question is that the better the general training a nurse has received, the better the maternity nurse and midwife she will subsequently become. On the other hand, the supply of generally trained nurses is usually insufficient for the obstetrical as well as the general needs of a country. In New Zealand it is found that, while the generally trained nurse is willing and often eager to obtain a maternity or midwifery certificate, she is only occasionally willing to make use of it in active practice. A number of them are quite prepared to take staff appointments for a time. A few

subsequently become matrons of maternity hospitals. The proportion who are willing to undertake obstetrical nursing as their work in life is very small. Therefore, at present at all events, their numbers must be very largely supplemented by the untrained woman. Fortunately, experience proves that such women, if they possess the ordinary degree of education and intelligence, can be turned by proper training into highly efficient maternity nurses. I am doubtful, however, if it is wise to allow them to become midwives, especially if they are then to be allowed to hold staff appointments and to be responsible for the training of probationers.

(4) *Is the course of training for each class of nurse sufficient in either New Zealand or England?*

Before answering this question it will be well to compare the period of training adopted, and the rates of maternal mortality in these and in other countries. The following table shows the length of the different courses :—

Central Midwives Board, England and Wales . . .	<div> <div>For midwives</div> <div>For maternity nurses</div> </div>	<div> <div>With general training, six months. Without general training, twelve months.</div> <div>With general training, six months. Without general training, twelve months.</div> </div>
Nurses and Midwives Registration Board, New Zealand . . .	<div> <div>For midwives</div> </div>	<div> <div>With general training, eight months, which include the period of training as a maternity nurse, provided the two courses are taken consecutively.</div> <div>Without general training, four months, <i>exclusive</i> of the period of training as a maternity nurse.</div> </div>
Denmark . . .	<div> <div>For midwives</div> <div>For midwives</div> </div>	<div> <div>Two years.</div> <div>Three years.</div> </div>
Holland . . .	<div> <div>For maternity nurses</div> </div>	<div> <div>Six months in hospital, and eighteen months' work in the hospital district.</div> </div>

The details of the Dutch training are as follows :—

For the Midwife.—Three years' residence in hospital.

First Year.—Theoretical training in the following subjects : general education, anatomy, physiology, physics. She also gets practical demonstrations and watches labours.

Second Year.—Continuance of theoretical instruction and practical work in the hospital.

Third Year.—Continuance of the work of the second year, and also practical work in the district. The pupil also attends " Welfare Centres," etc.

All pupils must by law deliver ten women in the hospital and ten outside, but usually they deliver from fifty to sixty. They are not allowed to conduct abnormal cases.

For the Assistant-Midwife (or Maternity Nurse).—Six months' residence in hospital, and then eighteen months' work on the district under supervision. They are not allowed to make vaginal examinations or to conduct labours.

Accordingly we see that the relative periods of training as a midwife for women, who have not had general training, compare as follows in months : England and Wales, 12 ; New Zealand, 16 ; Denmark, 24 ; Holland, 36. This is an extraordinarily wide variance.

The relative rates of maternal mortality, for the six years ending 1927, in the four countries I have mentioned above are shown in the Table on p. 43.

If the training of the midwife was the only factor to be taken into account in judging the causes of

varying rates of maternal mortality, it is obvious that both the English and New Zealand courses are insufficient. There are, however, at least two equally important accessory factors, namely the nature of the "obstetrical attendant," and the skill of the medical practitioner. In Holland and the Scandinavian countries, as we have seen, almost all normal labours are conducted by midwives. In New Zealand they are almost all conducted by medical practitioners, and, in England and Wales they are about equally conducted by medical practitioners and

Country.	No. of Live Births.	Mortality per 1,000 Live Births.
England and Wales .	4,327,505	3.96
New Zealand . . .	169,494	4.87
Holland	1,081,096	2.59
Denmark	365,193	2.36

midwives. Moreover the obstetrical knowledge, or at any rate the opportunity of obtaining it, of the average medical practitioner in Holland and the Scandinavian countries is greater than in the British Empire, and skilled specialists are more readily available to come to his assistance.

It is therefore impossible to state that the low mortality rate in the former group of countries is the direct result of the prolonged training of the midwife. It is, however, permissible to state that the care of normal labour by midwives who have been given a prolonged training, and who are sup-

ported by medical practitioners who have also had a prolonged training, results in a considerably lower death rate than does the system usually adopted in the British Empire.

To return to my original question—Is the course of training for each class of nurse sufficient in either New Zealand or England ?

So far as New Zealand is concerned I am inclined to think that the course for maternity nurses is sufficiently long. The midwives' course is another matter, and, if there was any considerable proportion of women in this country who were attended by midwives alone, I should be in favour of lengthening it until the course for the generally trained nurse became a year, and that for the untrained woman two years. As things are, however, midwives almost invariably work under medical practitioners, whether in hospitals or outside them, and so I think that for the time being the course is sufficient. When our policy is changed, and it is generally recognised that normal cases are safer in the hands of midwives, I shall certainly be in favour of the more prolonged training I suggest.

I regret that I cannot express even a qualified approval of the course of training prescribed by the Central Midwives Board. I doubt the wisdom of trying to train every maternity nurse to be a midwife. I entirely disapprove of allowing the training of either class to be conducted in private, *i.e.*, by a midwife in ordinary practice. I deplore the system which does not require uniformity of training. As to the period of training, while I

regard a year as sufficient for a maternity nurse, I think the period for a midwife should be doubled.

I am very pleased to find that in these views I have the support of Dame Janet Campbell, with whose sane and progressive views on the subject of training generally I am in accord. She writes as follows (Protection of Motherhood, Ministry of Health, London, 1927) :—

“ I submit the following suggestions for consideration :—

“ That there should be two classes of midwifery certificate :—

“ (a) For the practising midwife whose training cannot be too good or too thorough ;

“ (b) For the ‘ obstetric nurse ’ who desires some knowledge of midwifery for work in hospital, in the public health service, or in private nursing, but who does not intend to practise as a midwife.

“ That midwifery training schools should be classified, and that only those schools which can offer a full and complete training should be allowed to accept pupils in class (a) ; incomplete schools should only be permitted to take pupils studying for the certificate of ‘ obstetric nurse.’ . . .

“ If the training period were extended to eighteen months or two years, it might be desirable to include within this period practice ‘under supervision after sitting for the examination and before the certificate was finally granted.’ ”

In another place, Dame Janet Campbell writes :—
“ One great difference between the training of midwives in England and in other European

countries is that here they are trained in all manner of institutions large and small, and even by midwives in ordinary practice, with a corresponding variation in method, practice, and opportunity ; whereas there they are trained in a limited number of maternity hospitals definitely set aside and recognised by the State for the training of midwives, so that all pupils receive uniform instruction by specially qualified teachers."

This is the principle which has been devised in New Zealand, where midwives can only be trained in thirteen selected public hospitals, and maternity nurses either in these hospitals or in nineteen others, also public hospitals and specially selected.

With the object of promoting uniform training in these hospitals, not only has the curriculum been clearly laid down, but the system of nursing to be followed and taught has been clearly prescribed and must be followed.

I have felt compelled to criticise adversely the rules laid down by the Central Midwives Board, and it seems to me that the Board itself is by no means unanimous in regard to the principles which govern these rules. I think that it is this lack of unanimity which has led to the drawing up of the memorandum accompanying them. It seems to me that the Board is prepared to throw on to the teachers the onus of judging far more than the necessary standard of general education. I regard such an attitude as unfortunate, still, assuming for the moment that it is unavoidable, the memorandum is in many respects admirable. I take the liberty of quoting the

following paragraphs for the benefit of those who have not seen it. They run as follows :—

“ While recognising that the woman, who is to play so responsible a part in the maternity service, must start with an education not merely sufficient to enable her to fill up notification forms and keep records and understand the rules under which she works, but such as will enable her to make the fullest use of her training, have an educative influence on others, and maintain the high standard of conduct expected of her, the Board has felt it difficult to lay down any hard and fast educational standard, and has preferred to throw on the teachers the onus of satisfying themselves that the pupil, before being accepted, has sufficient general education to enable her both to pass the Board’s examination, and afterwards to fulfil the obligations laid on her by the Midwives Acts. This allows the teacher either to refuse to undertake the training of an illiterate pupil, or to refuse at an early stage in her studies to continue her training as soon as the inadequacy of her education becomes obvious. Unless teachers make a point of satisfying themselves of the sufficiency of education, a hardship may be inflicted on otherwise deserving women, who may find, after an expenditure of time and money they can ill afford, that they are not equipped for the profession of a midwife, and may be refused admission to the Oral Examination.

“ The term of training having been increased, all bodies or persons approved to train should consider carefully how an increased efficiency can be obtained

commensurate with the additional time available for training.

“ Particular attention is drawn to the certificate of ‘ having examined and received instruction in the supervision of not less than twenty pregnant women, including booking and keeping of records.’ An ante-natal clinic affords excellent opportunities for instruction in the hygiene of pregnancy, in abdominal palpation, in the care and treatment of the minor disturbances of pregnancy, and in the examination of urine. The linking up of the ante-natal supervision with the management of labour and the after-care of mother and infant, will form an object-lesson in the practice of preventive medicine, and afford the opportunity of giving the pupil a wide outlook on the preservation of the health and efficiency of the mothers, the avoidance of foreseeable complications in labour, and the preparation for the nursing and care of their babies. Attendance at ante-natal clinics is not by itself sufficient. It must not be isolated, but part of a system, and further it is essential that the midwife herself should acquire a methodical habit in booking her patients, of carefully investigating her cases and recording her findings, and thus learning how to pick out those cases requiring medical supervision. Although the new Rule requires that the pupil shall have examined and received instruction in the supervision of not less than twenty pregnant women, as a general rule many more cases ought to have passed under the observation of the pupil.

“ The actual conduct of labour is not the only

essential of midwifery training, and the Board does not wish teachers to regard the *number* of cases delivered as the all-important factor, and ventures to hope that, in the absence of an increased number of cases to be delivered, the effort will be made to make better use of the present number now that longer time is allowed.

“ The addition, however, is made of ten labours to be witnessed, and usually the teacher will begin the instruction of pupils by familiarising them with the conduct of labour either in hospital or on district, so that when their turn comes to deliver patients they will have some acquaintance with their duties. Though this method has doubtless already been general in large institutions, it is now made compulsory and the Board trusts that as much as possible will be done to bring the pupil to the actual delivery of her cases well prepared for what is before her.

“ A further condition is also attached to the deliveries by the pupil, in that the first five cases personally delivered must be attended in an institution approved by the Board, and that of the remaining fifteen at least five must be attended in the patient's own home. Similarly, in regard to nursing, at least five patients must have been nursed in their own homes. The object is to ensure that the pupil first learns the methods of surgical cleanliness under the easiest and best possible conditions, and afterwards extends her education by attending and nursing five outdoor cases, so that she may also learn how to apply hospital methods to the more difficult circumstances of the patient's home and how to

improvise and make the best of what she finds there. District training also enables the future midwife to be instructed in the conduct of domiciliary practice, the keeping of a register, the sending of notifications, and the fulfilling of many other duties that may not come to her notice in a large hospital, such as her relations with, and duties to, the local Health Authority, and co-operation with private medical practitioners and voluntary and other agencies for the assistance of mothers and babies.

“ Although the personal delivery of twenty cases is the minimum required by the Board, it is expected that each pupil will deliver more, especially in institutions with a small number of cases. It is clear that in the large institutions with a constant succession of cases and manifold resources and activities, those under training are much more occupied throughout their term of service with matters obstetric than in the smaller institutions ; in the latter, more cases should be given to each pupil to compensate for the less continuous experience and less frequent impressions. The less intensive character of the training is the reason why, with a small number of cases (*e.g.*, at the rate of one daily or, say, 300 per annum), the number of pupils allowed to be trained at one time is limited to a number much below that calculated on the basis of twenty allotted to each, and training institutions and teachers should bear in mind that, when granting approval, the Board will exercise its discretion as to whether or not a condition limiting the number of pupils to be trained at any one time shall be imposed.

“No rule is made as to how the cases to be personally delivered are to be distributed over the period of training, because the Board wishes to allow as much latitude as possible to training bodies. A previous ruling by the Board, that the cases should not be crammed into a few weeks, but should be spread over at least three months, may be taken as a working basis, and modified to meet the needs of the individual pupil, and the conditions under which her training is conducted. The problem will be a simple one in large institutions with a constant succession of cases and large numbers of pupils. The woman without previous nursing training will require as long as possible to become thoroughly imbued with the ritual of surgical cleanliness by the nursing of patients, and in assisting senior pupils in the labour ward, before learning the actual delivery of the patient. While conducting her indoor cases she will also acquire experience, and learn her duties by assisting others and witnessing many labours, until judged competent to undertake outdoor cases, and then will be able to conduct her final cases under less obvious supervision so as to acquire self-reliance.

“In the more difficult circumstances of small institutions the period devoted to the cases personally delivered should be compressed into a shorter time so as to allow of more frequent impressions, say two deliveries a week for seven weeks, and one a week for six weeks ; the senior pupil should then be in a position to help junior pupils under supervision, so as to increase her experience and teach her to take

responsibility. These suggestions will, it is hoped, suffice to indicate to teachers to arrange the time of each pupil so as best to fit her to become a practising midwife ; the scheme of mapping out the period of lengthened training at the end of this memorandum will give further hints in this direction.

“ The greater the attention given to the individual needs of each pupil the better will the education be ; and it is hoped that as soon as possible the training institutions will be able to determine the distribution of the unallotted deliveries solely on the principle of giving greater benefit to their pupils. Thus, a fully trained nurse, already drilled in hospital methods and in the practice of asepsis, requires more outdoor experience, for improvisation in poorly provided homes is new to her ; often, too, a hospital-trained nurse finds difficulty in accommodating herself to responsibility without a doctor within easy call, and in any case has still to learn how social conditions affect her patients and how to co-operate with public authorities and voluntary agencies. On the other hand, the woman without nursing training can probably adapt herself more easily to the practice of domestic midwifery, but requires more hospital drill before she acquires the aseptic ritual as a matter of habit. It is therefore better that the untrained woman should have as much indoor service as possible. The technique of surgical cleanliness should be learnt first by assisting in the nursing of lying-in mothers and babies, and in the work of the labour ward ; as experience is acquired a more responsible part in nursing may be given her until

she is competent to begin her deliveries in hospital ; her final instruction in carrying out hospital methods in the patient's home should be postponed till her teachers are satisfied from observation of her work that she has acquired and can carry out the principles of asepsis.

“ Special courses of instruction for advanced pupils which are not insisted upon (though mentioned as desirable in footnotes in the Regulations) should be arranged whenever possible, *e.g.*, visits to puerperal fever wards and bedside instruction in the symptoms and signs of puerperal infections and in their nursing and care ; visits to, or attendance on, ophthalmic hospitals or the ophthalmic departments of general hospitals for the purpose of gaining direct experience of ophthalmia neonatorum ; attendance on V.D. clinics, infant clinics, and mothercraft schools. In University towns and where there is a medical school, visits to museums, laboratory demonstrations and any other means of stimulating interest and thought among the pupils should be encouraged.

“ There is one aspect of the teaching of the pupil-midwife for which no rules or regulations can be made, and of which there is no possibility of testing a candidate's capacity by examination, and that is, training in resourcefulness, self-reliance, and the ability to take responsibility. It is essential, however, that all teachers should remember that their pupils are not equipped to undertake the office of midwife till these qualities have been acquired, and that their methods are at fault unless adapted to develop and

bring out such qualities. In the later part of the training, therefore, it is important that supervision should become less obvious, that opportunities should be found to leave the senior pupil to her own resources but with assistance within easy call. Every teacher must decide in regard to each individual pupil when and how far the close supervision necessary at first can be relaxed with safety to her patient. Those, who merely teach the subjects of the syllabus and the practice of midwifery, may fail to develop in their pupils the qualities that will enable them to become efficient midwives. Only by constant effort and thought as to how each of her pupils can be made into a safe and efficient midwife ready to take her place in the maternity service, can the teacher make the dry bones of these rules live.

“The pupil should be encouraged to study the temperament and character of her patients, and their domestic and social circumstances, so that she may have an understanding both of the individuality of her patient and of the conditions in which she lives and has to rear her family. The successful teacher has the faculty of imparting to her pupils something of that power of securing the confidence of and influencing for good those who come under her care at an impressionable moment of their lives.”

It will be noted that, under the New Zealand regulations, maternity nurses are not taught vaginal examination, and are confined to rectal examination. Midwives, on the other hand, are taught both rectal and vaginal examination. There is considerable diversity of opinion on this point. In this country,

where I inspect annually the training schools for midwives, I find great difficulty in getting some of the medical staff to recognise that it is necessary to teach midwives how to make vaginal examination, as they consider that all necessary information can be obtained *per rectum*. On the other hand, in other hospitals I find a certain amount of indignation because maternity nurses too are not taught vaginal examination. My own mind is rather open on the point. I have not had considerable experience of rectal examination during labour, and consequently I am perhaps inclined to underestimate its value. Also, I am doubtful of its effect on the asepsis of a nurse, who has already enough difficulties to contend with without adding the risk of fæcal contamination.

I am, however, quite clear on certain points. If vaginal examination is to be taught to nurse or student it must be taught effectively. I shall refer to this in a moment. If, however, the main result of teaching a midwife vaginal examination is only to enable her to carry out preliminary diagnosis for the medical attendant, and to enable him to postpone his arrival until the last moment, then it is better to leave it untaught. The amount of injury which may be done by her repeated examinations, and by the failure of the medical practitioner to make himself responsible for the preliminary diagnosis, is to my mind far in excess of the possible benefit that may result from her skill in examining. As such examinations are usually made under the directions of the medical practitioner and in order to keep him posted in the progress of the case, there seems to be

no way of stopping the practice except by stopping teaching the method. It is doubtful, however, if this is feasible in the case of the midwife, since she has to be trained to take cases by herself, and to be able to teach others how to do so. Therefore, unless it is found possible to substitute rectal examination in all cases and to forbid midwives to make vaginal examinations under any circumstances, the teaching of vaginal examinations must continue.

The possibility of substituting rectal for vaginal examination universally is a matter of great importance, but it is also one on which I, personally, hesitate to express a definite opinion. If rectal examination can be made equally instructive, and if it can be carried out without any danger of contamination of other parts, dressings, instruments, etc., then it is obvious that it should replace the dangerous practice of vaginal examination, and should be the only method taught. I am, however, very doubtful if it can replace the vaginal method satisfactorily in difficult cases, and it is only in difficult cases in which either form of examination is essential. By difficult cases I mean, *ex grege*, cases of prolonged labour in which a large caput succedaneum obscures the presenting part, cases where the presenting part is high and so is difficult to reach, cases of tumour formation in the lower part of the uterus or cervix, and so forth. When the only point at issue is the progress of labour, then a rectal examination is obviously sufficient.

The danger of contamination from the rectal contents is always present. I agree that it can

readily be avoided by the use of different gloves. Still, in the haste of a labour, perhaps taking place in a badly lighted room, the possibility of confusion is considerable.

Up to the present time I have agreed that midwives should be taught vaginal examination, in order that they be able to practise it when attending cases by themselves, but I am not sure that I am right in so doing. I have quoted on p. 153 the Regulations of the Canton Zurich regarding ante-natal baths and coitus. These same Regulations forbid midwives to make vaginal examinations and, as expressed by Professor Walthard, run as follows :

“ It is proved by the statistics of the country that puerperal fever is still prevalent in private practice. We know that bacteria that cause puerperal fever are frequently conveyed by examination of the genital tract with the fingers (vaginal examination).

“ In private houses most of the labours are conducted by midwives.

“ We know now that the signs, which teach a midwife the normal or abnormal progress of labour, can be recognised early by rectal and external examinations.

“ The Board of Directors of the Canton Zurich in their new orders for the education of midwives substituted rectal for vaginal examination, and further the midwives are forbidden to make any vaginal examinations.”

I think it will be necessary to consider carefully whether Professor Walthard's view is not the correct one, and whether the greater benefit to the greater

number of women will not result by forbidding midwives to make vaginal examinations.

For medical practitioners the question is quite different. They must be taught vaginal examination for use in abnormal cases, but they must also be taught, and made to realise to the full, that it is a form of obstetrical examination which is only permissible if carried out under conditions of complete asepsis.

I think that, so far as this book is concerned, I must leave the position somewhat as follows: All nurses should be taught rectal examination. It is the only method they should be permitted to use when a medical practitioner is also in attendance. The midwife, who is to practise alone and to teach others, must herself be taught both measures. Moreover, if vaginal examination is to be taught, it must be taught effectively. Perfunctory examinations made to comply with regulations are futile. The pupil must examine carefully, and she must then write down what she finds. Her findings must be checked by a member of the staff who has also examined the patient. Subsequently, she must be made to follow the case and see whether events prove her findings to be right or wrong.

This means that, in training schools, vaginal examination of patients must be frequent, and carried out to an extent which is entirely opposed to the very proper teaching that vaginal examinations in labour must be avoided. As a result, the conscientious medical officer or matron objects and, unless care is taken, the mind of the pupil is confused. A simple statement of the position is that a training

school must train properly, and that in doing so it must incur certain risks that are to be avoided in practice. Constant watchfulness, the most careful asepsis, and the rigid exclusion from examination of patients in whom skin or other infections are present will—as experience shows—help to make the morbidity in training schools no greater than elsewhere. At the same time it must be clearly brought home to the minds of the pupils that what is permissible for the sake of teaching is forbidden in practice.

There are two important aids to the teaching of pupils: the hospital chart, and the pupil's personal "Case Book." Hospital matrons are very much inclined to regard the hospital chart solely as a hospital record, which must be written up with the greatest care and neatness, and from which all error—whether of diagnosis or of fact—is to be rigidly excluded. This from the point of view of a hospital record is admirable, but from the point of view of the chart's other function, that is of serving as a source of instruction to the pupils, it is unfortunate. Accordingly, I think that in two respects at least the average matron's ideal of absolute accuracy and neatness must be neglected.

In the first place, the chart adopted in every teaching hospital should give ample space for the pupils to write down the results of their examinations—whether external or internal. Further, these results should be written by the nurse immediately after the examination is made—whether they are right or whether they are wrong. Subsequent events will check them, and their comparison with

the diagnosis of others will create a spirit of friendly rivalry that is helpful. The appearance of the chart, and its reputation for strict truth necessarily suffer.

In the second place, each entry on the chart should be completed *pari passu* with the course of the labour, and should not be postponed until the end of the labour in order that it may be written with greater care. The object of this is that, at any moment during the progress of a labour, the chart may be a complete record of the labour so far as it has gone. The nurses in attendance in the labour ward should be encouraged to study it carefully, and to bring its records into relation with the condition of the patient as they see her. Again neatness will suffer, but education, and also the welfare of the patient, will benefit.

The pupil's personal Case Book is also an important adjunct to training. Various forms are doubtless in use. The form I describe has been adopted by the Nurses and Midwives Registration Board of New Zealand, and is a somewhat extended copy of the case book, which has been in use for many years in the Rotunda hospital. This Case Book is oblong quarto in size and contains 165 pages which are allocated as follows :—

- “ Lectures attended,” with space for 120 entries.
- “ Assistances at labour,” with space for 60 entries.
- “ Labour patients prepared,” with space for 40 entries.
- “ Conditions,” with space for 20 entries.
- “ Lying-in patients nursed,” with space for 60 entries.

- " Babies nursed," with space for 40 entries.
 " Catheters passed," with space for 20 entries.
 " Abdominal palpations," with space for 40 entries.
 " Vaginal examinations," with space for 40 entries.
 " Rectal examinations," with space for 40 entries.
 " Obstetrical anæsthesia," with space for 18 entries.
 " Abnormal cases seen," with space for 20 entries.
 " Ante-natal patients examined," with space for 60 entries.
 " Patients nursed in } 40 charts with facing
 the lying-in wards." } pages for daily notes.
 " Abnormal cases seen } 20 charts with facing
 in the labour ward." } pages for daily notes.
 " Temperature charts }
 of special interest of } 20 charts.
 patients nursed and }
 seen." }

A single line is allotted to each entry and is divided into suitable headings. The following may be taken as a type.

VAGINAL EXAMINATIONS

Patient's initials.	Date.	Stage of labour.	Diagnosis proved later to be right or wrong.	Notes on points of interest.
1.				
2.				

Etc.

Each book is inspected weekly by the matron, and its entries verified, and each candidate has to present the completed book at her final examination. Its objects are to encourage neatness of writing and a habit of recording cases, and to give a record of the work done and the cases seen which is both of interest and value in subsequent years.

A very important part of a nurse's instruction deals with the arrangement of the room in a private house in which the patient is to be confined. I am afraid the need for proper arrangement is often overlooked, with the result that confinements occur under conditions which are unnecessarily hampering and dangerous. District work, in which probationers attend patients in their own homes under proper supervision, is very valuable for teaching the arrangement of a lying-in room, and the many other details in which midwifery in a private house differs from midwifery in a well-conducted hospital. I will discuss later the arrangement of a lying-in room which seems to me to be best (*v.* Chapter VII). Here, I only want to emphasise the necessity of making nurses realise that a great deal can be done to avoid complications by an intelligent arrangement of the room at the beginning of labour. The treatment of inevitable complications is thereby facilitated.

It will be noted that, in New Zealand, nurses are instructed in the giving of anæsthetics to the obstetrical degree. This is a very necessary part of their training. Obstetrical anæsthesia, intelligently induced during the second stage of labour, is not merely a means of relieving pain, but is also a means

of promoting normal deliveries and reducing the number of "forceps cases." The nurse is the person who usually has to give the anæsthetic, and she may often have to do so in the absence of the medical attendant. Therefore, it is only wise that she should learn how to give the anæsthetic correctly. The method I advise will be discussed later.

The general principle followed in New Zealand in regard to lectures is that each nurse, of whatever class, receives during her training one lecture weekly from a medical officer of the hospital, and one lecture weekly from the matron, and from a member of the nursing staff—that is to say, three lectures weekly in all. This is the minimum prescribed, and it is supplemented by clinical lectures and demonstrations. Systematic lectures are undoubtedly necessary, but clinical lectures are even of greater value, and every opportunity should be taken to give them. It is not necessary to show the pupils an abnormal case in order to lecture on the abnormality, a normal case often does as well, and full use should be made of such. For systematic lectures, well designed and correct diagrams are essential, and they are by no means easy to obtain. For this reason lantern demonstrations, with slides made from really good book illustrations, etc., are better and are more interesting. A suitable phantom and doll, a fœtal skull and a cast of a fœtal head, and a female pelvis are all essentials. The actual skull is necessary to demonstrate its structure, but for carrying out the various movements of labour, a cast is preferable as it is not so easily broken. These

things should always be at the disposal of the nurse during her study hours.

The lectures of the matron and the nursing staff largely consist of practical demonstrations, and should carefully include instruction in such things as belong to midwifery practice in a private house as opposed to midwifery practice in a hospital. This is particularly necessary in regard to all matters relating to the practice of asepsis and antisepsis.

There is one considerable difficulty in the way of providing an effective clinical training, and it is perhaps even more marked in Great Britain than in New Zealand. It is the insufficiency of "clinical material." Dame Janet Campbell alludes to it, and emphasises one of its causes: "Again there is the question of the patients available for practical teaching. The number of women willing to submit to attendance by a pupil midwife in return for cheap or gratuitous service is becoming steadily less, and, as further facilities become available for aiding the necessitous mothers, patients for teaching purposes will become increasingly difficult to obtain. . . . It will therefore become probably necessary to consider how best the practical teaching of midwifery can be organised, and whether medical students and women proposing to practise as midwives should not have prior claim to the best available facilities."

The special committee appointed by the British Medical Association has also drawn attention to this matter (*v.* Chapter X).

In New Zealand, where the position has not yet become acute, a considerable number of generally

trained women take a midwife's certificate without any intention of using it practically. Unfortunately, they are encouraged to do so by Hospital Boards who, when giving a staff appointment, are inclined to favour applicants with a midwifery certificate, even though the post for which they are wanted is concerned solely with medicine or surgery. Sooner or later such candidates must be excluded, in order that the training of those who really intend to practise midwifery may be more effectual.

THE SELECTION OF TRAINING SCHOOLS

It is obvious that, at the present time, maternity nurses and midwives must be trained in public maternity hospitals, and that the training of either by midwives or medical practitioners in private practice is out of date. Moreover, a hospital should not be recognised as a training school until, after inspection, it has been found to be qualified to undertake the work both in respect to the number of patients confined annually and to the character of the teaching staff. Private maternity hospitals must be definitely excluded. I will suggest what I think are the essential qualifications of a training school for (a) maternity nurses, (b) midwives :—

For a training school for maternity nurses the following are necessary :—

(1) A matron and sisters, who are both trained nurses and midwives.

(2) A medical staff, which is both capable of giving the necessary instruction and prepared to devote the necessary time to it.

(3) A sufficient number of confinements annually to allow at least three nurses to be trained at the same time. It is, I think, very difficult to train a smaller class than three. The lack of the stimulus of competition, the difficulty of lecturing a single person, and the absence of mutual help all tend to prevent a satisfactory result.

(4) A willingness on the part of the matron and medical staff to carry out the prescribed principles of teaching and nursing in order that a uniform system of teaching may prevail. This is a necessary condition, as otherwise teaching and technique would vary within too wide limits in different places. It is also particularly necessary to have approximate uniformity in view of the fact that the medical staff of the smaller training hospitals are seldom obstetrical specialists.

(5) The necessary equipment for teaching purposes, and for carrying out the care of the patients in accordance with the principles of aseptic technique.

The essentials of a training school for midwives are on the same lines as for maternity nurses, but in some respects are wider. In the first place, midwives should only be trained in a "clinical hospital" either similar to, or identical with, a clinical hospital for training medical students. Their medical teachers should be specialists. The number of labours annually in the hospital should be sufficient to allow at least six, and preferably ten, midwives to be trained at the time. The matron should be a woman whose past experience and general character will enable her to guide as well as to teach, and to

keep before her pupils the high ideals and standards of their future work.

In order to obtain a uniform standard of teaching it is most advisable that training schools should be inspected annually by officers of the central authority. Such a course may seem to be, and doubtless is, unnecessary in the case of the great training schools of Great Britain and Ireland, but in the case of the smaller establishments it is essential. I think I may say that in New Zealand such inspection has been entirely beneficial, and that the considerable discrepancies in teaching and in practice that existed in the different hospitals are being steadily lost. When inspections were begun, it was often found that methods, that were regarded as impracticable and unnecessary in one hospital, were the standard practice of another, and that nurses, who had been trained in one, were more or less at sea when they were appointed to staff positions in another.

If anyone doubts the wisdom of trying to obtain a uniform standard of training, perhaps I may emphasise its importance in one direction at all events. In modern surgery there is but one system, or standard, of asepsis. In midwifery practice there are probably dozens, each of which possesses its own defects. When these systems are swept away, and replaced by a system common to all, we know that all nurses are being taught the system that is considered best at the present time. Moreover, it is possible to initiate any improvements in it that experience suggests.

A similar remark applies to obstetrical nursing matters generally.

POST-GRADUATE TEACHING

Midwives and maternity nurses, like medical practitioners, must get periodic "refresher courses," if they are to maintain the correct standard of practice. Unfortunately, it is by no means easy for a midwife in busy practice to give up her means of livelihood for several weeks, and, when she does so, her body wants rest and relaxation just as much as her mind wants improvement. The ideal system seems to be that adopted in Denmark, where "refresher courses" of five weeks' duration are given twice yearly, and the State pays all the expenses of midwives who wish to attend them.

I recognise that demands on the public purse for such purposes are, theoretically, objectionable. In practice, however, it is obvious that, if the public welfare necessitates postgraduate instruction, it must be given, and that, if women cannot themselves pay for it, someone else must do so.

The best type of "refresher course" to give is probably a matter on which opinion will differ, but I think it is safe to make the following stipulations. The course must be given at a suitable clinical hospital with sufficient clinical material. A purely theoretical course has a purely theoretical value. It must be as practical as possible, and include antenatal work, labours, obstetrical nursing, and the actual carrying out of the details of obstetrical asepsis. It should also include lectures on the

subjects of most importance to the practising midwife.

It should be made possible for the practising midwife to attend such a course once in every three or four years.

CHAPTER IV

THE EDUCATION OF THE MEDICAL ADVISER

THE possibility of improving medical education in obstetrics is so great that we can confidently expect a very considerable reduction in maternal mortality when once the Universities and other licensing bodies awake to a fuller sense of their responsibilities in this matter. To emphasise the point I will compare the teaching and mortality of two countries. In Holland, at the University of Utrecht, the course for medical students is as follows :—

Total length of medical course—six years.

Second Year.—Two hours weekly devoted to theoretical instruction in midwifery and to demonstrations on the phantom.

Third Year.—Three hours weekly devoted to similar instruction.

Fourth Year.—Ten hours weekly devoted to similar instruction.

The student then passes an examination in theoretical midwifery.

Fifth and Sixth Years.—The work is as follows :—

(1) Eight hours weekly devoted to special instruction in practical obstetrics.

(2) Six week's dressership in the University

Midwifery Hospital, two weeks of which are spent in residence.

(3) One month as "Extern Accoucheur," working on the district.

The standard of practical work for each student is—

(1) Twenty bi-manual examinations. These are presumably made on gynæcological patients.

(2) Fifty ante-natal examinations.

(3) Forty conductions.

There is adequate supervision during this course, and a student does not get credit for a conduction merely because he has helped the foetal head to pass over the perinæum. The University session lasts for nine months of each year.

Professor van Rooy, Professor of Obstetrics and Gynæcology in the University of Amsterdam, has sent me the following particulars regarding the students' work at the Frouwenkliniek der Universiteit of Amsterdam. The hospital contains 208 beds, of which 100 are devoted to midwifery and 108 to gynæcology. There is an average of 2,000 deliveries annually. I quote Professor van Rooy's own words :

"The Obstetrical and Gynæcological Courses are given regularly in the clinic. The students work in groups of eight, in the obstetrical as well as in the gynæcological ward.

"The head of the obstetrical clinic, namely the Professor of Obstetrics and Gynæcology, regularly gives lectures (*i.e.*, readings, lectures, etc.) to the students. These commence in the fourth year of the medical course, after the students have had one year of general clinical instruction.

“ The Professor delivers seven lectures per week, each of one hour's duration, of which five are devoted to obstetrics and two to gynæcology.

“ For the students of the last two years clinical cases are frequently demonstrated and discussed in these lectures. Moreover, in the afternoon, the students receive practice in operative obstetrics on the phantom.

“ The number of teaching hours for obstetrics are equal to those for general surgery.

“ Instruction in obstetrics has been given at the Amsterdam University for nearly a century. Till the middle of last century this was given by the Professor of Surgery, after that by a special Professor for Obstetrics, and since the year 1890 by a Professor for Obstetrics and Gynæcology.

“ Gradually the number of teaching hours has increased, and at present the instruction in obstetrics and gynæcology is on exactly the same scale as that in general surgery and internal surgery.

“ Further, there is an ambulatory service for gynæcological and one for obstetrical patients. At this gynæcological service every woman can be examined if wanted and treated *pro deo*. If necessary these women are brought into the ward. And all those patients who have been treated in the hospital are subject as well to the control of this ambulatory service for a period the length of which depends on the gravity of the disease for which treatment was required.

“ At the obstetrical ambulatory service pregnant women of Amsterdam come for counsel, to be

controlled about weekly, until the moment they must be brought into the obstetrical ward. If during this weekly control the pregnancy is complicated with albuminuria, loss of blood, etc., the woman is sent at once to the obstetrical ward, else she is admitted about two weeks before the end of pregnancy. This ambulatory service takes place every day ; the students participate in groups. As such they get well educated in the hygienic care of pregnant women."

In New Zealand, on the other hand, the University course was as follows up to the end of 1927. Since then some slight improvements have been made :

Total length of Medical Course, six years.

Fifth Year.—Attendance on a course of fifty theoretical lectures.

Fifth and Sixth Years.—The work is as follows :—

(1) " Attendance on " twenty midwifery cases, of which at least four shall have been attended under proper supervision at a maternity hospital.

(2) Twelve attendances at the ante-natal clinic under the supervision and to the satisfaction of the University tutor.

(3) Attendance at the University maternity hospital (which has sixteen beds), when called on for practical instruction on the application of the forceps, and on the course and conduction of any abnormal or difficult case. Each student attends approximately six abnormal labours.

(4) Attendance on twelve clinical lectures delivered by the University tutor.

With such variant ideas of the essentials of midwifery training in front of us, it is interesting to compare the relative rates of maternal mortality in the two countries. They are as follows :—

Holland (six years' statistics) 2.59 per 1,000 live births.

New Zealand (six years' statistics) 4.87 per 1,000 live births.

Here again in estimating the part played by medical education in the reduction of mortality there is a complicating factor, namely that in Holland the midwives conduct normal cases and that they receive a much longer education than in New Zealand. Still it is hardly possible to defend a high death rate, by saying that medical practitioners attended the normal cases. It may, however, be an explanation of such high rate, and to my mind it is one for the reasons I have mentioned in Chapter II. Further, even if midwives attend normal cases, the practitioner must be highly trained to enable him to deal with the abnormal ones, or else the mortality rate will mount.

The problem of medical education in obstetrics is one which it is very difficult to solve. It is clearly shown by the statistics of the Queen Victoria Jubilee Institute, of Holland, and of the Scandinavian countries, that there is something radically wrong either with British medical education or with the manner in which it is subsequently carried into practice. To my mind both are at fault. A newly qualified medical man once announced some curious views on the management of normal labour. I said

to him, "I'm sure you were never taught that such views are right." "No," he answered, "but I haven't yet decided whether I shall do what I have been taught, or whether I shall do as everyone else does." He was quite serious.

It is this kind of attitude which, added to the known difficulties and dangers of combining obstetrical and general practice, makes me doubt if it is feasible materially to lower maternal mortality and still adhere to the present systems of instruction and practice.

I have given briefly the conditions of training prescribed in Holland, where it is apparently possible to produce practitioners skilled in the management of abnormal labour. It will be interesting to see how the "recommendations" of the General Medical Council on obstetrical instruction compare with them. Incidentally it may be noted that the Council has no power to compel the medical schools to obey their recommendations. It can only "recommend." The recommendations I quote came into operation on January 21st, 1922. So far as I know there has been none issued since then. The recommendations run as follows :—

"Midwifery and Diseases of Women. — Instruction during a period of at least two terms, comprising :—

"(1) Courses of systematic instruction in the principles and practice of obstetrics and gynaecology.

"(2) Lectures or demonstrations in clinical obstetrics and gynaecology, and attendance on in-patient and out-patient gynaecological practice.

“(3) Instruction in the following subjects, viz. :—

(a) Ante-natal conditions ;

(b) Infant hygiene.

“(4) Every student should, after attending the courses of systematic instruction in the principles and practice of surgery and of obstetrics, give continuous attendance on obstetrical hospital practice, under the supervision of a competent officer, for a period of three months, during one month of which, at least, he should perform the duties of an intern student in a lying-in hospital or ward. He should attend during the period twenty cases of labour under adequate supervision. Extern or district maternity work should not be taken until the student has personally delivered at least five cases in the lying-in hospital or ward, to the satisfaction of his teacher.

“A certificate of having attended twenty cases of labour should state that the student has personally attended each case during the course of labour, making the necessary abdominal and other examinations, under the supervision of the certifying officer, who should describe his official position and state how many of the twenty cases were conducted in hospital.”

These “recommendations” only express the minimum standard of teaching “*De minimis non curat lex*,” but the General Medical Council is not the “law” and it has to care for “*minima*.” That is to say, it has to word its “recommendations” in such a manner as to make it feasible for Universities and licensing bodies, whose teaching powers are limited,

to obey them. This is probably unavoidable, but it does not help to bring obstetrical teaching up to the necessary standard or to reduce maternal mortality.

While I recognise that the first three recommendations constitute a distinct advance, I think that the fourth suggests that it has been drafted by a lawyer, who had decided to bring just a little obscurity into it. Its vagueness consists in the use of the terms "continuous attendance," "attend," "personally delivered," "personally attended." It seems to me that the recommendation is intended to suggest that each student should conduct twenty labours, but that it is so drafted as to make only five conductions actually necessary. If this is not intended, then the wording of the recommendation seems to be unfortunate.

The terms of the certificate are also unsatisfactory, because the signed certificate offers the only guarantee of the training the student has received, and if his training is limited to the matters mentioned in the certificate—well, competent medical aid for the puerpera will not be available !

Let us see what it means.

A student "personally attends" twenty cases of labour. That is to say, it is sufficient if he watches the same midwife delivering twenty women. He must make "the necessary abdominal and other examinations." That is to say, it may happen that he makes none, because they may not be "necessary" in the cases he "attends." It is true that there must be a "certifying officer" present, who must state his official position. But this again may

be the midwife, as the word " his " must necessarily be read " her," and I cannot find any provision elsewhere that lays down medical supervision as necessary. The certificate must state how many of the twenty cases were conducted in hospital, but, even if the number complies with the previous recommendation that he should personally deliver five cases, the certificate will still enable a medical man to begin practice on the experience given by, *inter alia*, the conduction of five labours.

My criticism of what is undoubtedly an earnest attempt to raise the standard of education may seem a little harsh. Still, if the first three recommendations are intended to be carried into effect, why should not the certificate on which the candidate is to be admitted to his examination definitely state that he has complied with them ?

It will be interesting to see how a number of Universities and licensing bodies have tried to carry out these recommendations.

UNIVERSITY OF CAMBRIDGE

Diligent attendance on a course of instruction in midwifery. Gynæcological practice in the wards of a recognised hospital for two months. The performance during one month of the duties of an internal student in a recognised lying-in hospital or ward of a recognised hospital. The delivery of at least five cases in a lying-in hospital or ward to the satisfaction of his teacher, and the personal conduction afterwards of fifteen cases of labour in a clinic under the supervision of the certifying officer.

UNIVERSITY OF LONDON

The minimum period of study devoted solely to this subject shall be five months. The course of instruction shall include : One month's attendance at a lying-in hospital, or the lying-in ward of a general hospital, and the personal conduct therein of five labours under supervision. The personal conduct, subsequent to experience as medical clinical clerk and as surgical dresser and to above, of twenty labours, including the five mentioned in the preceding paragraph. Attendance at an ante-natal clinic for a period of two months. An appointment as clinical clerk in the gynæcological wards and out-patient department of a recognised hospital during three months.

UNIVERSITY OF DUBLIN

Attendance on a course of systematic lectures on midwifery. Attendance for not less than twenty-one months, after having completed the Intermediate Medical Examination, Part I, on the practice of a recognised clinical hospital. The holding, before commencing the study of practical midwifery, the office of (*a*) clinical clerk and (*b*) surgical dresser in a recognised general hospital. Regular attendance at a recognised maternity hospital as a non-resident student for a period of six months, or as a resident student for a period of three months, during which he has received practical instruction in midwifery, personally conducted twenty cases of labour under official medical supervision, and received instruction in ante-natal conditions and in infant hygiene.

UNIVERSITY OF WALES

A course of instruction in obstetrics and gynæcology which shall include: One term of systematic lectures. One term of attendance on gynæcological hospital practice, including clinical clerking.

Attendance on twenty labours, under the conditions laid down by the General Medical Council.

UNIVERSITY OF EDINBURGH

A course of systematic lectures on midwifery. Tutorial classes are held for revision and practical instruction in the use of obstetrical and gynæcological instruments and appliances. Midwifery is studied clinically in the Royal Maternity Hospital. Clinics and practical instruction are given by the Professor and lecturers on clinical obstetrics. Each course extends over one term. In addition to attendance at clinics and demonstrations, the student is expected to follow all the work of the hospital, including the ante-natal department.

The candidate must have conducted twenty cases of labour, under such conditions as the senatus, with the approval of the University Court, may from time to time determine; or, have attended for three months the practice of a lying-in hospital, or of the maternity department of a general hospital or other public charitable institution, and have conducted personally twelve, or such an additional number of cases of labour as the senatus, with the approval of the University Court, may from time to time determine.

In accordance with the recommendations of the General Medical Council, it is required that, before commencing the study of practical midwifery, every student shall have held the offices of clinical medical clerk and surgical dresser, and have attended a course of lectures on surgery and midwifery. Further, it is required that every student in his fifth year shall give regular attendance during a period of three months at the Royal Maternity Hospital where clinics are conducted. Further, he must attend the demonstrations in the museum and laboratory of the department of midwifery in the University. Attendance on outdoor cases shall be under the superintendence of the ordinary physicians and of the extern obstetric physicians of the Royal Maternity Hospital. Before conducting cases the student must have conducted six cases in the hospital.

THE CONJOINT BOARD, LONDON

A course of instruction in midwifery. Three months' gynæcological clerkship.

Candidates will be required to produce the following certificate, viz. :—

“ It is hereby certified that.....
has attended as clinical clerk in the obstetric and gynæcological wards and out-patient department for a period of three months, and has under my supervision carried out his clinical studies, including the examination of such a number of pregnant women and gynæcological patients as in my opinion qualifies him to present himself for the final examination in midwifery and gynæcology.”

Attendance on five labours conducted by a teacher or member of the staff of an approved hospital and the subsequent conduction of fifteen other labours.

THE IRISH CONJOINT BOARD

Before being allowed to present himself in midwifery and gynæcology, a candidate must produce evidence :

That he has attended diligently, during a period of two terms, a course of systematic instruction in midwifery delivered by a recognised teacher. That subsequently to his having attended such a systematic course of instruction in midwifery, and to his having acted as medical clinical clerk and surgical dresser, he has attended diligently, for a period of three months, the practice of a recognised lying-in hospital, or the lying-in wards of a general hospital, and, after having received practical instruction in the conduct of normal labour, that he has, under official medical supervision, attended the delivery of at least twenty patients. That he has attended diligently, on not less than thirty-two days, the gynæcological department of a recognised hospital, and that he has therein received practical instruction in the diagnosis and treatment of diseases of women. That he has received instruction in ante-natal conditions, and in the care and management of infants.

THE SCOTTISH CONJOINT BOARD

Midwifery and diseases of women. Systematic instruction in the principles and practice of obstetrics and gynæcology for one term.

Clinical obstetrics and gynæcology, with attendance on in-patient and out-patient gynæcological practice, to include instruction in ante-natal conditions and infant hygiene one term.

Practical midwifery. Every student before commencing the study of practical midwifery shall have attended a course of lectures on surgery and midwifery, and be required to have held the offices of clinical medical clerk and surgical dresser. Every student should, after attending the courses of systematic instruction in the principles and practice of surgery and of obstetrics, give continuous attendance on obstetrical hospital practice, under the supervision of a competent officer, for a period of one term, during one month of which, at least, he should perform the duties of an intern student in a lying-in hospital or ward. He should attend during the period twenty cases of labour under adequate supervision. Extern or district maternity work should not be taken until the student has personally delivered at least five cases in the lying-in hospital or ward, to the satisfaction of his teacher.

A certificate of having attended twenty cases of labour should state that the student has personally attended each case during the course of labour, making the necessary abdominal and other examinations, under the supervision of the certifying officer, who should describe his official position and state how many of the twenty cases were conducted in hospital.

I am afraid it is not easy to find in the various regulations given above evidence of a general opinion

that the minimum of the General Medical Council is wholly insufficient. Yet until such an opinion does arise and produce its effect, medical education in obstetrics will continue to be ineffective.

Besides the present general inadequacy of curriculum, there is another obstacle to the full education of the student in midwifery. It may be called a sentimental obstacle, but its effect is practical. It is the *status*, the prestige, the relative importance—call it what you will—which is attached to the obstetrical side of medical education. Midwifery is admittedly regarded as the handmaid of medicine and surgery. The time given to it, even in proportion to the time it demands, is shorter. In many schools of medicine, it does not even boast of a Professorial chair. Now it is obvious that a man can be a physician or surgeon of the highest rank, though ignorant of the fundamental principles of midwifery. It is equally obvious, however, that he cannot be a general practitioner of any satisfactory rank unless his knowledge of midwifery is even greater than that of the other subjects. The proportion of students in any year in a medical school, who will become general practitioners, is many times greater than of those who will devote themselves to pure medicine or surgery or any special branches of these subjects. A general practitioner with a large midwifery practice, and with an inadequate knowledge of midwifery, can do as much harm as his, perhaps entirely adequate, knowledge of medicine and surgery can help him to do good. The conclusion is obvious. Every medical student

must be taught the subject adequately until the time comes that medical students are allowed to specialise.

It is in part the past want of proper obstetrical education that is leading to the belief that women in normal confinements are safer under the care of midwives. They are safer not only because, as I suggested previously, one potential source of infection is avoided, but also because there is not the interference with normal labour that results from a want of the knowledge that tells when interference is both necessary and permissible.

Instruction in operative midwifery and the treatment of obstetrical disease is very necessary, but instruction in the recognition and management of normal labour is essential. It is quite correct to say that eighty or ninety per cent. of women will deliver themselves without any assistance. So they will, if they are allowed to do so. This is where the half-educated practitioner fails, for he does not realise that it is necessary to allow the labour to be normal.

It is an easy matter to criticise obvious faults and their consequences, but in doing so we must also remember that the blame falls more on the system than on the individual. Insufficient obstetrical education, the assumed inferiority of midwifery practice, the bad example of senior practitioners, inadequate fees, and the importunity of relations, all must bear their share. Much material improvement should result from improved teaching in the medical schools, and if, as I have said before, the former improvement is proportional to the possibilities of

the latter, we should be able to look forward confidently to a marked reduction in maternal mortality.

I pass on from criticism to efforts at construction. A complete obstetrical department of a medical school should be constituted somewhat as follows :—

(1) A department for instruction in systematic midwifery, and gynæcology, and in anatomy, physiology, pathology, and bio-chemistry as applied to these subjects.

(2) A hospital devoted to midwifery and gynæcology, and possessing ample accommodation for resident students.

(3) An extensive ante-natal, post-natal, infant, and extern department, both for patients attending at the hospital, and for women who are attended in their labours in their own homes.

The *personnel* attached to this department should be as follows :—

(1) A Professor of Midwifery and Gynæcology. It is to my mind essential that the two subjects should go together.

(2) A number of Assistant Lecturers, to help in systematic teaching, in proportion to the number of students in the class. I suggest an Assistant for every twenty-five or thirty students.

(3) The professors of anatomy, physiology, bio-chemistry and pathology in so far as their services are necessary for systematic and practical instruction in matters relating to obstetrics.

(4) A sufficient number of assistant obstetricians and gynæcologists, house surgeons, etc., to conduct the work of the hospital, both intern and extern.

(5) A number of senior students, who are admitted as clinical assistants.

The professorship should be a whole time appointment with liberty to undertake consultations with other practitioners. The Professor's residence should be either in the hospital, as in the case of the Rotunda Hospital, or as close to it as possible.

The assistant lecturers might, I think, be part-time appointments.

A proportion of the assistant obstetricians and gynæcologists should be whole-time resident appointments, the remainder being part-time. The proportion of the former would depend on the size of the hospital. These posts should be for a term of years and should not be renewable, their secondary object being to provide as many practitioners as possible with a specialist's knowledge and experience.

The house surgeons are whole-time resident posts, and practitioners, who have held them, should be given preference when selecting obstetrical and gynæcological assistants.

Such a department can give, in full measure, on its undergraduate side the instruction necessary to train sound general practitioners, and on its post-graduate side the necessary courses for the maintenance of their knowledge. While the posts of house surgeon and obstetrical assistant provide the means of training specialists.

What proportion of his whole medical course should a student devote to the subjects of midwifery and gynæcology, and how is that time to be

allocated, bearing in mind the emergencies of hospital service ?

I have already emphasised the importance of a knowledge of midwifery to the general practitioner. Remembering this importance, is it too much to claim one-sixth of a six years' course for its study, including gynæcology ? I do not think it is. Still, I will lower the demand to a part-time year, arranged as follows : During the first six months, the student attends systematic lectures on midwifery and gynæcology, and devotes the remainder of his time to medical and surgical clinical work or lectures. During the second six months, he gives his entire time to the study of practical midwifery and allied subjects, and practical gynæcology.

As it is necessary that a student should attend his systematic lectures in midwifery before beginning his practical work, such an arrangement entails two courses of systematic lectures annually. Otherwise, either students will only be ready for their clinical work every second six months, or else the period between their systematic lectures and clinical work will be too prolonged.

If a course of lectures numbers sixty, and if three lectures are delivered weekly, this allows ample time for vacation, etc.

It is not intended that systematic lectures should consist of nothing but lecturing. Practical demonstrations, in which the students themselves take part, should form at least a third of the course, and it is mainly for these demonstrations that the assistant lecturers are wanted. The lectures themselves

must be fully illustrated by diagrams, lantern slides, and book illustrations, thrown on the screen by the epidiascope. Cinema demonstrations, if films are available, are also most valuable.

The second six months of the students' course must be devoted mainly to practical work in obstetrics, but it will also include certain allied work, to which I will refer in a moment, and attendance at the gynæcological work of the hospital.

Under the heading of practical work I include the following :—

(1) Attendance at daily clinical lectures in the hospital.

(2) The examination of labour patients.

(3) Attendance at labour cases : (a) in the hospital wards, (b) in the extern department.

(4) Conduction of labour cases : (a) in the hospital wards, (b) in the extern department.

(5) Attendance at the ante- and post-natal clinic.

(6) Attendance at the infant clinic.

(7) Attendance at all abnormal cases.

(8) Daily visits to the lying-in wards, and observation of the course of the puerperium, particularly in the case of patients at whose labour he has assisted.

(9) Daily visits to patients whom he has delivered in the extern department.

(10) Attendance in the gynæcological wards and extern gynæcological department, and at gynæcological operations.

Clinical lectures delivered by the University professor and his assistants should be attended regularly. That is to say, the student should attend

on every occasion unless he is engaged on other obstetrical work. The same may be said in regard to attendances on labours, with the proviso that he should not be expected to be present both by day and by night. One or other period should be assigned to him. Moreover, due consideration must be given to the limitations of the hospital and the numbers in the class of students.

Attendance at the ante- and post-natal, and infant clinics is similarly regulated—that is to say, the student should attend every clinic which the limitations of the hospital make available. It is hard to give fixed numbers for these attendances. In New Zealand, the woman without general training, who wants to be a midwife, must in a sixteen months' course examine at the ante-natal clinic at least sixty patients. It is obvious that a student, who is going to be responsible for the care of the abnormal as well as the normal, cannot need less, and presumably wants as many more as he can get.

The examination of labour patients includes abdominal palpation, and vaginal and rectal examinations. The number of examinations, prescribed for the woman without general training who desires to become a midwife, are, in a sixteen months' course, abdominal palpation ninety cases, vaginal examinations thirty to forty cases, rectal examinations sixty cases. Again I may ask, does the student who will attend the abnormal as well as the normal want less? I am afraid I must leave the matter at that, and confine myself to adding that every fragment of clinical opportunity in the hospital should be made

use of, and each student get the maximum share possible.

Attendance at all abnormal cases night or day should be enforced, as should be regular daily visits to the lying-in wards, and to the student's own extern cases.

I have left the question of attendances at, and conduction of, labours to the last, as being the most difficult to answer. The generally accepted minimum up to the present has been twenty conductions, in spite of the fact that the recommendations of the General Medical Council are rather vague. This number, whether its increase is or is not feasible, is insufficient. I suggest, as a revised minimum, twenty *conductions* in the hospital, and twenty *conductions* outside. At least ten intern cases should be conducted under thoroughly competent supervision before any are taken in the extern department. In addition, the student should attend at least thirty labours.

The practical work detailed above and in addition gynæcological work, into the details of which I am not entering, will still leave a certain amount of spare time which the student may reasonably be supposed to devote to work. Such time should be given to attendance at the lectures and demonstrations of the professors of anatomy, physiology, biochemistry, and pathology, on their particular subjects as applied to pregnancy and labour and to their diseases.

For a certain proportion of this second period of six months the student must reside in the maternity

hospital, in order to be in closer touch with his work. His period of residence should be three months, but again the limitations of the hospital and the number of students will affect it. It should never be less than one month. I am inclined to think that the period assigned for hospital residence at Utrecht is too short.

A pertinent question comes up for consideration. Who is to lay down the details of a student's training? I very definitely hold that it is the duty of the Licensing Bodies to do so, and that they should attain uniformity by agreement, or by the friendly "compulsion" of the General Medical Council. I do not think that it is proper to leave the matter to the hospitals. If there is only one hospital which serves a medical school, it can maintain the necessary standard, but if there are several hospitals, which more or less compete against one another, it is impossible for one to adopt standards which are higher than that of the others, and it is most undesirable that they should have the power of adopting standards which are lower. Therefore, I think that the Licensing Bodies are the proper people to state their requirements and to insist that they are carried out. If the Licensing Bodies reduce their standard below the required minimum, then it should be in the power of the General Medical Council to denounce such standard, in the same way as it can denounce an examination, as insufficient.

I would go a little further, and suggest that each student should be provided with a standard obstetrical case book, on the lines of that used by nurses, in which he keeps the record of the obstetrical work

he has done. These books, if the occasion necessitated, should be open to the inspection of the visitor of the General Medical Council just as are the final examinations of the Licensing Bodies.

If anyone considers my ideas are Utopian, let him compare them with the conditions under which, in Holland, students are trained in obstetrics, and then compare the annual death rates of Great Britain and of Holland. He will find that my suggestions differ slightly from the Dutch requirements, but I do not think they are any more exacting.

I can imagine that it will be said that it is not feasible to give students the clinical experience I have suggested, that, in fact, there is not the clinical material to provide it. The answer to this is that unless the demand for medical practitioners is so great that the world must be content with inferior practitioners, their numbers must be regulated by the possibilities of training them. The onus should be thrown on the medical schools of providing the necessary education, systematic or clinical, with the necessary consequence that they cannot accept more students than they can educate. A training school for midwives recognises such limitations, and limits its pupils accordingly. A medical school should do the same. A professor of chemistry will not overload his laboratory with strap-hangers for whom he has no bench accommodation, nor should his school overload itself with students for whom the necessary clinical material is wanting.

If the clinical experience, which I have suggested, is necessary in order to provide medical practitioners

who are capable of giving skilled care to pregnant and parturient women, it must be provided. The only alternative that I can see is to stop teaching midwifery to medical students, to train midwives more efficiently, and to create a large class of obstetrical specialists trained after graduation who will be available for the treatment of abnormal cases. I do not suggest such a course with approval. Except in so far as it would tend to place normal patients under the care of midwives. The difficulty of making specialists universally available would be too great—at any rate, until aeroplanes are capable of vertical flight! When this occurs, it will solve a number of medical difficulties.

Postgraduate Training.—Postgraduate training has two objects—first, to maintain and add to the knowledge of the general practitioner, and, secondly, to train the specialist.

Postgraduate courses for general practitioners should be part of the work of all large maternity hospitals. Both courses differ very little from those suggested for students, and their object is *not* intensive training in obstetrical operations. These operations must certainly be taught, but even more essential at the present time is instruction in the management of normal labour, in diagnosis, and in the avoidance of operative interference and of infection. It is often difficult to induce the general practitioner to realise that he wants such instruction, and I have seen men, whose knowledge of normal midwifery was fragmentary, leave a maternity hospital because their time was not wholly taken up in

watching abnormalities. The attention of the post-graduate student should also be directed to the study of diagnosis, and of disease, whether maternal or ovular. Constant attendance at the ante-natal clinic is also advisable. The wise practitioner will make a postgraduate course in obstetrics a five-yearly habit.

The training of an obstetrical specialist is a prolonged business. It should begin, if possible, with house surgeons' and house physicians' work in a general hospital, or, failing that, with a few years in general practice. After that should come from three to four years' residence in a subordinate position in a maternity and gynæcological hospital attached to, or working with, a medical school. At the end of that time, he is competent to begin work as a specialist, but, if he can obtain and continue to hold a part-time post as obstetrician or assistant obstetrician, he will continue to add to his knowledge in a manner which he cannot do in private practice alone. Travel to other countries, and the observation of the work of others, will also largely help.

I doubt if there is any system of training the obstetrical specialist which is superior to that carried out at the three large maternity hospitals in Dublin almost since their foundation. It is seen in its best form at the Rotunda Hospital, because there the developing specialist must reside in the hospital during his whole period of training. The training begins by the practitioner taking a resident course as a postgraduate student of from three to six months' duration. He then holds the post of clinical clerk and extern maternity assistant for a period of six months, during the second half of which he is

responsible for the overseeing of the extern maternity department, and for the treatment of all abnormal cases therein under the directions of the Assistants to the Master. He then becomes, if selected, an Assistant to the Master for a period of three years, during which he is responsible, *inter alia*, and under the directions of the Master, for the overseeing of all patients confined in the hospital, for the treatment of such abnormal cases as may be assigned to him by the Master, and for the out-patient and ante-natal work of the hospital. When he leaves the hospital there are very few obstetrical complications of which he has not had a considerable experience. Some idea of this experience may be given by saying that, during his approximately four years of residence, something like 16,000 patients will have been delivered in the intern and extern departments of the hospital. He is also thoroughly trained in gynaecological work during the same period.

The Dutch system is somewhat similar, though not so prolonged. The period of training is two years in all, but, before a practitioner can enter on it, he must have held the post of house surgeon for two years in a general hospital.

The urgent need for a specialist's advice in difficult midwifery is sometimes wholly lost sight of. In England the tendency is to try to make such advice more generally available throughout the country. In New Zealand, on the other hand, I regret to say that, practically speaking, nearly all the opportunities of training specialists are wasted. A country, in which the opportunities of giving special training are so small, cannot afford to waste a single opportunity.

CHAPTER V

THE PRIVATE MATERNITY HOSPITAL

THE private maternity hospital and the small maternity hospital, or annexe, built in connection with local general hospitals, play a large part in the care of the woman in labour. Unfortunately, owing to the manner in which they are usually built and managed the part they play in the reduction of maternal mortality is not great. Built and managed in the proper way they ought to be a very large factor in its reduction.

It may be well to begin by stating what a private hospital ought not to be. A private hospital ought not to be simply a house into which women are taken for their confinements, and in which the latter are conducted under conditions as inconvenient and risky as in a private house. This means a complete reversal of the present state of affairs. It means, first, that the hospital is specially built as a hospital, with due attention to convenience, sanitation, and asepsis. It means that it is primarily established for the benefit of the lying-in woman, and not as a means of livelihood for a midwife. It means that under no circumstances does a married matron maintain her family in the same building. It means that there is a properly qualified matron, who possesses both general and special training, and

who is assisted by an adequate and trained staff. It means that the necessities for the carrying out of labour and of obstetrical operations and for the treatment of emergencies are all available.

Lastly, it means that there is adequate inspection of the hospital to ensure that these conditions are fulfilled.

I will consider these points one by one.

A small private maternity hospital should, if ground space is available, be a one-storied building. Two stories necessitate a lift, and this is a considerable addition to the original cost. It should be built of a permanent material, and not of wood. Its rooms should be so arranged that it falls naturally into three sections, one for ante-partum and labour patients, another for lying-in patients, and a third for administrative and staff quarters. It is essential that ante-partum patients shall not run any risk of acquiring infection from patients who have been already confined, an occurrence which is probably a common cause of infections the origin of which is obscure.

It is advisable that the nurses' sleeping quarters should be as far from the labour ward and general hospital disturbances as possible. I regard three bathrooms as necessary, but I recognise that the cost is often prohibitive. It is most unwise that a woman on admission should be washed in a bath which is also used by patients prior to leaving hospital, for I do not think that there is any method that is going to produce complete asepsis in the bathroom. Thus two separate bathrooms are necessary for the

patients, and one for the nurses. Similarly, there must be separate sanitary accommodation for the nurses and patients.

The ante-partum section of the hospital consists of a labour-ward, with small sterilising room attached, and a store for the linen, etc., used by waiting patients and in the labour ward. If it is a hospital with wards, as opposed to private rooms, there should be an ante-partum ward for waiting patients. There must also be a bathroom. The whole section should be shut off by a door from the rest of the hospital.

The lying-in section consists of the necessary number of wards or private rooms. If all patients are usually treated in wards, there must also be one or two single rooms for patients who are seriously ill, such as eclamptics, or for the temporary isolation of possible cases of infection before their evacuation elsewhere. There must also be a sterilising room, a sink room, and a bathroom.

In country districts there is very commonly a demand for the inclusion of one room for "emergency cases"—accidents, or the like. While I can quite understand how the provision of such a ward appeals to the lay mind, which perceives a hospital and does not understand why it cannot be used for any case that urgently calls for hospital treatment, still I am opposed to the system. Emergency cases are often infected, *e.g.*, a sudden appendicitis. They call for emergency operations, which of necessity are carried out in the labour ward. The routine of the hospital is upset and infection results.

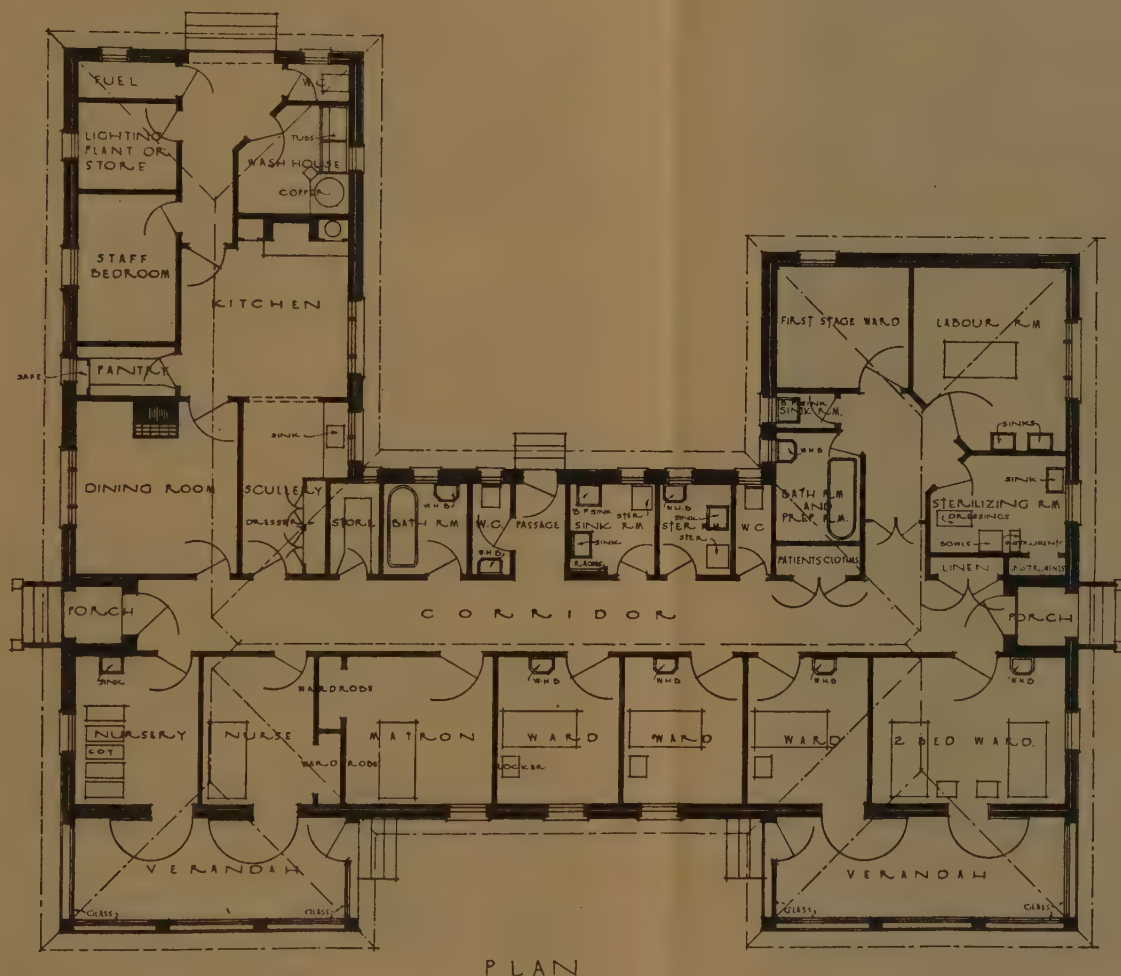
For the greater good of the greater number of patients, a maternity hospital should be for maternity patients, and for no one else.

The extent of the nursing and administrative quarters depends on the size of the hospital. The suggested provision for a hospital of five beds will be seen in the appended plan.

It is unnecessary to enter into the details of construction, seeing that the necessities of hospital construction are now so well understood. A few general principles, however, may be given :—

The labour ward should be built with an impervious floor, rounded corners, and the general details of a small operating theatre. There should be a small double sink for washing purposes, a lotion bowl carried on a ring support projecting from and built into the wall, a four-minute sand glass beside the sink, and a one- or two-minute glass beside the lotion bowl, for timing “washing-up.” All pipes should be carried on ring supports two inches off the wall, and all basins and sinks on cantilever brackets four inches off the wall. Glass shelves also supported on cantilever brackets are a general convenience. An instrument cupboard may be similarly supported, and a slate shelf for the instrument steriliser. A sound general principle is to try, so far as possible, to keep things off the floor, as it is then much easier to keep the room clean.

The practice of plugging walls with wood, and screwing brackets and other supports to the wood, must be condemned. I have never seen a job of the



PLAN

FEET 10 20 30 40



TECHNICAL BRANCH,
HEALTH DEPARTMENT,
WELLINGTON.

Plan showing suggested arrangement of a five-bed maternity hospital.

Note.—The plan is drawn for the Southern Hemisphere. For the Northern Hemisphere the rooms should be changed from right to left, so that the labour wards are on the north-west corner, and the kitchens, etc., on the north-east.

[To face p. 100.

kind that did not eventually result in the breaking of the plaster and the destruction of the wall.

The movable equipment of the labour ward will be described a little later.

The equipment of the wards should be as simple as possible, and all cupboards, presses, etc., should stand on legs which raise them well clear of the floor. Each bed has a locker beside it, at the back of which is a place for a "chamber."

The sterilising room contains a wash basin and lotion bowl for the nurses' use ; a sink for washing the patients' "washing-pans" and bowls, and a rack on which they are stored ; a small high-pressure steriliser for dressings, and a "washing-pan" and bowl steriliser.

The sink room contains a sink in which to rinse out sheets, diapers, etc., prior to sending them to the laundry ; a flushing sink for bed-pans, a bed-pan steriliser, and a rack for storing bed-pans.

If it is found more convenient the high pressure dressing steriliser and the bed-pan steriliser may be placed elsewhere.

The general and instrumental equipment of the hospital is as follows : There are three essential appliances used in the nursing details of the patient—"chambers," bed-pans and "washing-pans," and there must be sufficient accommodation to allow each to be kept in its proper place.

The reason for providing both "chambers" and bed-pans will be discussed later (*v.* Chapter VII.), as will be the method of using and sterilising all three.

There should be a suitably designed "locker" by

each bed, one compartment of which opens to the back and is used for the "chamber."

The beds should be of a suitable hospital pattern.

If possible, there should be a fixed wash basin in each room or ward, and this must not be of the "corner" type, as this pattern is usually both inadequate and dirty. A small slate or glass shelf beside this basin, on which the nurse can place dressing trays, etc., is a great advantage.

A comfortable chair for the use of the patient when she gets out of bed is also necessary.

Beyond these things, the less furniture in the room the better.

The equipment of the labour ward or the labour sterilising room is as follows :—

(1) The labour couch. Various types are available. Simplicity and possibility of easy cleansing and disinfection are the necessities. The couch should be low, so that when a nurse sits on it to palpate her feet are on the floor, and that during the application of the forceps the operator can sit on a stool of suitable height with his feet also firmly on the floor. Unless the couch is adjustable, blocks must be provided to raise the head or the foot as is found necessary.

(2) An adjustable douche stand, and a can, a metal container, and tubing.

(3) An instrument table, and a dressing table.

(4) An instrument cupboard.

(5) A small instrument steriliser.

(6) A stool for the operator, adjustable as to height.

(7) Certain instruments which either are in frequent use or are so urgently required in emergencies that they must be always available. These instruments are as follows :—

- (a) Clinical thermometer.
- (b) Metal catheters (2).
- (c) Two pairs of large scissors.
- (d) Rubber gloves.
- (e) Cotton thread for tying the cord.
- (f) Gum elastic or rubber catheter for use as a mucus-extractor.
- (g) Drugs : ergot, chloroform.
- (h) Murphy's chloroform inhaler.
- (i) Antiseptics : iodine, biniodide of mercury, and lysol or kindred antiseptic.
- (j) Instruments, etc., for the treatment of shock or hæmorrhage as follows :—
 - (a) Saline infusion apparatus for subcutaneous and intravenous saline infusion.
 - (β) Tablets for making intravenous saline infusion.
 - (γ) Sealed packets of iodoform gauze for plugging.
 - (δ) Vaginal speculum.
 - (ε) Needle holder.
 - (ζ) Half-circle needles for suturing cervix.
 - (η) Artery forceps.
 - (θ) Sterilised catgut for ligatures and sutures.
 - (ι) Intra-uterine douche tube.
 - (κ) Pituitrin, morphia, and strychnine in ampoules.
 - (λ) Hypodermic syringe.
 - (μ) Scalpel.

- (*v*) Two volsella, or American bullet forceps for drawing down cervix.

I regard the presence in the labour ward of the appliances mentioned under (*j*) as essential in every case of labour, but I can understand a difficulty arising in deciding who is to provide them in private hospitals to which patients are sent by a number of practitioners. Most of the other appliances are the normal constituents of a midwife's bag, and therefore the matron of the home may legitimately be expected to provide them. Those required for the treatment of shock or hæmorrhage, on the other hand, are more essentially instruments or appliances for the obstetrician's use, and so are more properly provided by him. Unfortunately some of them are bulky and can only be carried in quantities necessary for use in a private house. If they are taken from his bag every time he attends a case in a hospital, they will possibly be missing when urgently required elsewhere.

Since they must be ready for use in every case, and as this is difficult to arrange if they are not amongst the normal "properties" of the labour ward, I think that they should be provided by mutual arrangement between the various practitioners attending the hospital and the matron. In any case, the supervising authority should insist on their presence as an integral part of the labour ward equipment.

The ante-partum bathroom must contain in addition to a bath, a "preparation board" on which the patient is placed during the preliminary preparation prior to her admission to the labour ward.

This board is hinged to the wall behind the bath, in such a manner that it can be dropped down to rest on the latter, which it completely covers. The preparation of the vulva, the giving of enemata, and abdominal palpation can be carried out on it, but vaginal examination is forbidden as the surrounding conditions are not suitable.

Another necessary appliance is a bath seat, on which the patient sits while being washed. Its object will be more fully discussed later (*v.* Chapter VII.). Here, it is sufficient to say that, when a patient sits or lies in the bath water, there is a danger of infection being carried directly into the vagina. Consequently, a bath without pelvic immersion is advisable, and probably necessary. The bath seat may be a simple piece of board cut a little larger than the width of the bath, on the side of which it rests. This, however, may cause splashing of the room, and consequently a seat made of a piece of wood, which is shorter than the width of the bath and which hangs by hooks inside the bath and lower than the top of the latter, is more suitable.

The remaining equipment of the hospital does not call for special comment.

The details of the aseptic conduct of labour and the puerperium will be discussed later. Here, however, it is necessary to consider the methods by which the *spread* of infection in a private hospital may be prevented.

There seem to me to be three chief ways in which infection can be carried from other patients to a

woman in labour or during the puerperium. These are :—

(1) Before or during labour, by allowing a patient not yet delivered to come into contact with possible infection from patients in the lying-in wards, either during her preliminary preparation or in the labour ward. I have already pointed out the necessity for an ante-partum bathroom which will not be used by the lying-in patients. I think it is clearly established that septic bacteria can be increased indefinitely in virulence by passage through the body. A patient—call her “A”—carries a very mild type of staphylococcus in her vagina. It does not affect her convalescence. It is conveyed from “A” to “B,” who has slight elevation of temperature, and possibly retarded healing of a perinæal tear. It is conveyed from “B” to “C,” who has symptoms of a septic endometritis, and recovers. It is passed on to “D,” who gets acute sepsis and dies. For this reason there should be an invisible, but none the less distinct, barrier between the ante-partum and the lying-in sections of the hospitals, and, so far as is practicable, it should be impossible for a patient prior to delivery to meet infection coming from a patient who has been confined. The use in other parts of the hospital of utensils and of apparatus, which belong to the labour ward, must also be condemned, unless they are of a kind that can be sterilised by boiling. The most common offender in this respect is probably the labour ward douche stand, which is taken to the lying-in wards for the treatment of septic cases and then perhaps hastily returned to

the labour ward unsterilised. Such or similar procedures are not permissible.

(2) During the lying-in, by the indiscriminate use of "chambers," bed-pans, and "washing-pans." A separate "chamber" must be kept for each patient. It is cleansed when it is emptied, and when the patient goes out it is sterilised by boiling. As I have suggested, it is best kept in the locker by the patient's bed, and under no circumstances may it be used for another patient without re-sterilisation. Bed-pans, if used, may be managed on a similar system, except that they must be kept in the sink room, and marked with the patient's name or number of her bed. A better system, however, is that each pan is sterilised by boiling after use and returned to the common rack. Washing-pans must be sterilised by boiling after use. Lotion bowls and instrument trays, etc., are sterilised after use and again before use, unless in the interval they can be kept under aseptic conditions.

(3) Either before or after labour, by placing the patient in a bed or room which has been infected by previous patients. In every maternity hospital the accommodation should be so far in excess of the demand on it that it is possible to close for cleansing and sterilisation each ward or room for twenty-four hours after each patient has left it. This is a comparatively easy matter in the case of single rooms. In the case of many-bedded wards it is more difficult. Still, it is usually possible, and it has been the practice for many years in the Rotunda Hospital, where it did much to compensate for wards of old design and for

occasional overcrowding. As soon as the ward has been emptied, and before any dusting or sweeping is done, the following course of disinfection is adopted :—

All windows are closed and sealed, and the fire-place, if any, is sealed. The bedding is spread out in single layers and lightly sprayed with five per cent. formalin solution. The room is then fumigated with an evaporation-lamp, using not less than thirty paraform tablets for each thousand cubic feet of enclosed space, or by burning not less than three pounds of sulphur for each thousand cubic feet of enclosed space. The door is then closed, and sealed by pasting paper over all cracks. The room is kept sealed for not less than twelve hours. On opening it, sunshine and fresh air are allowed to dry the bedding and blankets. The walls are wiped over with a cloth moistened with warm water to which a reliable disinfectant has been added, and the floor is thoroughly scrubbed. Where it is impossible to fumigate every time the ward is empty, it should be done at least every two months as a routine.

When sepsis has occurred in a hospital, disinfection must be more rigorous. The following measures are prescribed by the Health Department of New Zealand :—

“ 1. The bedclothes :—

“ (a) Sheets, pillow-slips, and other washable articles, except blankets, shall be steeped in a solution of reliable disinfectant for at least one hour, then washed and boiled.

- “(b) Blankets shall be steeped in a solution of reliable disinfectant for at least one hour, then washed in the ordinary way.
- “(c) By reliable disinfectant is meant a solution of—carbolic acid, 1 to 50; izal, 1 to 100; lysol, 1 to 100 : or such other solutions as the Medical Officer of Health may approve.
- “(2) Vessels and utensils : Vessels and utensils shall be sterilised by boiling in water for at least twenty minutes.
- “(3) Mattresses :—
 - “(a) Where the ticking is clean and in good repair, the method of surface disinfection of the mattress by formaldehyde or sulphur-dioxide gas, as set out in paragraph 4 below, shall be deemed to be adequate.
 - “(b) Where the ticking is soiled or torn the mattress shall not be used unless and until it has been disinfected by exposure to saturated steam in a proper steam disinfecter, or has been treated as follows : The contents to be removed and burned, the ticking boiled for at least twenty minutes, and new clean contents provided.
- “(4) The room :—
 - “(a) The room shall be fumigated by one or other of the following alternative methods :—
 - “(i.) The vaporisation in a lamp of a type approved by the Medical Officer of

Health of not less than thirty paraform tablets for each one thousand cubic feet of enclosed space.

“(ii.) The burning of not less than three pounds of sulphur for each one thousand cubic feet of enclosed space.

“(b) Prior to fumigation the windows, fire-places, and all apertures save the exit door, shall be sealed up by pasting paper there-over, and all articles left in the room shall be arranged so as to expose them so far as possible to the action of the fumigating agent. The exit door shall in turn be sealed when the fumigator leaves the room after commencing the generation of the gaseous fumigating agent.

“(c) The period of fumigation shall be not less than twelve hours, and during this period the room shall be left sealed.

“(d) After the expiry of not less than twelve hours, the room shall be entered and doors and windows shall be opened wide to ventilate thoroughly (air) the room. Mattresses, bolsters, and upholstered articles shall be well exposed to the sun and air. Furniture, pictures, ornaments, painted and varnished woodwork, etc., shall be wiped over with a cloth moistened with warm water to which a reliable disinfectant has been added, special care being taken to remove dust from joints and cracks. Dry dusting shall not be

done. Loose coverings on floors, whether carpets or linoleums, shall be removed from the room, and the floor-boards thoroughly scrubbed with soap, soda, or other washing-powder and hot water. The floor coverings before being relaid shall in the case of linoleum be washed on both sides, and in the case of carpets, be well cleaned. If the floor be covered throughout with linoleum it shall be deemed adequate if such linoleum be thoroughly scrubbed with soap, soda, or other washing-powder and hot water, care being taken to lift up and clean where any dust has lodged below the edges of the linoleum."

"Where the nurse is using strong disinfectants she should either use a mop or protect her hands with rubber gloves. For this purpose they do not require to be boiled. The roughening of the nurses' or midwives' hands by disinfecting-work should be avoided as much as possible."

"All members of the nursing staff who have been in any way exposed to infection must carry out the following method of personal disinfection:—

"(a) The nurse or midwife shall wash herself all over, including her hair, in a hot bath, using one per cent. biniodide of mercury soap.

"(b) She shall then make a complete change of clothing, all of which shall have been thoroughly washed, and when possible boiled since the last time they were exposed to infection.

“(c) All dresses and aprons, which she has worn while in attendance upon a septic case, shall be boiled for not less than twenty minutes.

“(d) She shall sterilise her hands and forearms by scrubbing them vigorously with a sterilised nail-brush in hot water and soap for five minutes, rinse them in water, and then immerse them for three minutes in a solution of the strength of one in 500 biniodide of mercury dissolved in methylated spirit of a strength of seventy per cent. She shall rub her hands and forearms with sterile gauze wet with the spirit, paying special attention to the roots of the nails and the skin between the fingers, and clean beneath the nails with a piece of wood, wet with the solution (a pointed wooden match is useful), but avoiding anything that is likely to separate the nail from the surrounding skin. At the end of three minutes, she shall wash off the methylated spirit and dry.

“In the case of a nurse who can be regarded as a contact, such disinfection is to be carried out three times at intervals of twelve hours. A fourth sterilisation shall take place at the end of forty-eight hours.

“After this fourth sterilisation any nurse who has been suspended from work on account of possible infection can return to duty.”

When the infection is of a virulent type it may be necessary to close the hospital. The instructions of the New Zealand Health Department in this respect run as follows: “There is strong evidence to show that three days is the normal period of

incubation of puerperal sepsis, and taking this as a standard, and allowing two days more as a margin of safety, making five days in all, it should be laid down that a hospital (except in circumstances of unusually severe or extensive infection) may be re-opened for the admission of new cases five days after the evacuation of the last case which showed any signs of morbidity or septic infection, and after disinfection has been completed and all nurses have carried out the required disinfection as recommended above."

Septic cases must not be allowed to remain in maternity hospitals unless there is an isolation ward available for them outside the hospital, where they can be nursed by special nurses who are themselves isolated from the rest of the hospital staff. There are practically no private hospitals in which such accommodation is provided, and consequently septic, or potentially septic, patients must be evacuated to their own homes or to a general hospital. The same rule applies to patients who, though they are not septic in a puerperal sense, have developed septic conditions which can serve to infect other patients, *e.g.*, pyelitis. Patients who on arrival are found to have septic foci of any kind, *e.g.*, boils, septic ear discharges, eczema, etc., should not be admitted to a maternity hospital.

The same stringent rule applies to members of the staff. If a nurse develops any septic condition she must be put off duty, outside the hospital, until it is cured. Then, after suitable disinfection as already described, she can return.

I mentioned previously two other essential conditions for the establishment of a suitable maternity hospital, and they are both so obvious as to require no elaboration. The matron should be a midwife who has had general training, and unfortunately the necessity for the latter is not always recognised. Her staff must be adequate. In the New Zealand Regulations, which I am about to quote, the minimum requirements in this respect are laid down. If the matron happens to be married, her family should not live in the hospital. In the type of hospital in which such a condition is likely to occur, the premises usually are sufficiently inadequate without adding to such inadequacy by overcrowding.

In order that there may be a guarantee that the different regulations and principles which I have mentioned are carried out as effectively as possible, all private maternity hospitals must be registered, and subject to such general regulations as may be made from time to time by the chief "Supervising Authority." They must be under the control of and subject to inspection by the local Medical Officer of Health, and also to inspection by officers appointed for the purpose by the chief "Supervising Authority."

As the due regulation of maternity hospitals is a matter of importance, I think it will be well to include here the more essential regulations laid down by the Health Department of New Zealand.

"Regulations governing Private Maternity Hospitals in New Zealand, gazetted April 21st, 1927 :—

"(1) (a) The licensee or manager of a private

maternity hospital shall enter or cause to be entered the following particulars in the Register of Patients:—

“ Name in full ; age ; usual residence ; date of admission ; number of previous pregnancies ; if anæsthetics have been administered, and by whom ; highest temperature reached during puerperium ; sex of infant, or infants, and weight at birth ; whether infant born alive or dead ; whether at full time or premature ; what precautions (if any) taken for infant's eyes ; how infant is fed—(i.) breast, or (ii.) breast and artificial, or (iii.) artificial ; date of discharge and condition of patient on discharge from hospital ; weight and condition of child on discharge ; if instrumental or special treatment given at delivery, give details ; if transferred to another hospital, reason for transfer ; in case of death of mother or child, state date and certified cause.

“(b) These Registers of Patients shall be in a book in the form approved by the Director-General.

“(2) The temperature charts to be kept shall—

“(a) Be of a type approved by the Director-General ;

“(b) Record daily the temperature of every patient in the hospital as it was between the hours of 6 a.m. and 8 a.m. and the hours of 6 p.m. and 8 p.m., and, in the case of maternity hospitals, the highest temperature observed in each twenty-four hours of the puerperium ; and

“(c) Be produced on the demand of any authorised officer of the Department of Health.

“(3) In every maternity hospital the temperature

chart of each patient in the hospital shall be so kept as to be available for inspection by any medical practitioner who is in attendance on a patient in that hospital, and, on the discharge or death of any patient, the temperature chart relating to such patient shall be reattached to the Register-book in the approved manner.

“(4) In the case of a private maternity hospital at which the maximum number of patients receivable does not exceed four no other midwife or maternity nurse other than the registered midwife required by the Act need be employed.

“(5) In the case of a private maternity hospital at which the maximum number of patients receivable exceeds four there shall be employed, in addition to the registered midwife required by the Act to be in residence at the hospital, one registered maternity nurse for every four patients in excess of the first four. If the maximum number is not exactly divisible by four there shall be an additional registered maternity nurse employed in respect of any patients in excess of four or a multiple of four. If the maximum number of patients receivable exceeds twelve there shall be employed, in addition to the midwife and maternity nurses hereinbefore provided for, a registered midwife for every twelve patients in addition to the first twelve. If the maximum number is not exactly divisible by twelve an additional registered midwife shall be employed in respect of any patients in excess of twelve or a multiple of twelve.

“(6) In every private hospital intended for the

admission of five or more patients there shall be provided apparatus for the sterilisation of gowns, dressings, towels, and the like, and in every private maternity hospital there shall also be provided appliances for the treatment of shock or hæmorrhage, in both cases to the approval of the Assistant Inspector of Hospitals.

“(7) It shall be an offence against these regulations for the licensee or manager of any private maternity hospital to permit any maternity patient to occupy a room or to use the equipment of a room which has been previously occupied or used by a woman presenting symptoms of morbidity unless such room and equipment, subsequent to the removal of such woman, have been disinfected in accordance with any instructions issued by the Medical Officer of Health, or in the absence of such instructions, as prescribed elsewhere.

“(8) No person shall attend any patient in a private hospital if such person is or has within the last seven days been in attendance as nurse on a case of infectious disease, whether in the same or another hospital or elsewhere, unless with the approval of the medical attendant in charge of such patient, and after taking such precautions as to personal disinfection as he may prescribe.

“(9) No person shall attend any maternity patient in a private hospital if such person is or has within twenty-four hours been in attendance as nurse on a case of disease of a suppurative character, whether in the same or another hospital or elsewhere, unless with the approval of the medical practitioner in

charge of such maternity patient, and after taking such precautions as to personal disinfection as he may prescribe.

“(10) No person shall attend any maternity patient if such person is or has within the last seven days been in attendance as nurse on a case of infectious disease, or a case of notifiable infectious disease, or a case which may reasonably be suspected to be a case of infectious disease or notifiable infectious disease, whether in the same or another hospital or elsewhere, until the Medical Officer of Health has certified that such person may do so.

“(11) Except in a case of emergency no licensee or manager of a private maternity hospital shall admit any patient suffering from the effects of a recent abortion or miscarriage, and where such admission is made the licensee or manager shall notify the Medical Officer of Health in the special form provided for that purpose.

“(12) The licensee or manager of any private maternity hospital shall forthwith notify the Medical Officer of Health, in the special form for that purpose, of any case in which puerperal pyrexia has occurred.

“(13) The licensee or manager of any private maternity hospital shall notify the Medical Officer of Health, in the special form provided for that purpose, of the death of any patient occurring in the private hospital or of the transfer of any patient to another institution for further treatment.

“(14) Every medical practitioner who becomes aware that any person attended by him in any private maternity hospital is suffering from puerperal

Maternity Hospitals.—Monthly Report.

This form must be completed on the first of each month by the Matron of every Maternity Hospital, public or private, and sent without delay to the Medical Officer of Health.

Report for the Month of _____, 19__.

- A. Name of Hospital : B. Name of Matron :
 C. Address : Town :
 D. Number of patients admitted during the past month :
 E. Number of patients confined at full term :
 F. Number of patients confined between the seventh month and full term :
 G. Number of abortions (*i.e.*, delivery before the seventh month) :
 H. Number of operations :—
 (1) Instrumental delivery :
 (2) Version : { External :
 Internal :
 (3) Dilatation of cervix :
 (4) Manual removal of placenta :
 (5) Cæsarean section :
 (6) Craniotomy, &c. :
 I. Number of cases of—
 (1) Accidental hæmorrhage :
 (2) Unavoidable hæmorrhage (placenta prævia) :
 (3) Post-partum hæmorrhage :
 (4) Eclampsia :
 (5) Puerperal morbidity : * { (a) Not notifiable—*i.e.*, mild :
 (b) Notifiable — *i.e.*, † puerperal pyrexia :
 J. Number of deaths of mothers :
 K. Number of deaths of infants who were born alive :
 L. Number of infants born dead : { (a) Who probably died before labour began :
 (b) Who probably died during labour :
 M. Number of patients transferred { (a) Before delivery :
 to other hospitals : ‡ (b) During the puerperium :

Date : Signature of Matron :

* Puerperal morbidity shall be deemed to be present in the case of the lying-in woman if at any time during her stay in hospital, before or within twenty-one days after childbirth, she has suffered from a febrile condition in which her temperature has risen to 100° F. or more on any two occasions, or has been sustained at 100° F. or more during a period of twenty-four hours.

† Puerperal pyrexia means any febrile condition occurring in a woman within twenty-one days after childbirth or miscarriage in which a temperature of 100·4° F. or more has been sustained during a period of twenty-four hours, or has recurred during that period.

‡ When a patient is transferred to another hospital the reason for so doing shall be briefly stated on the back of this form.

REASONS FOR TRANSFERENCE OF PATIENTS TO OTHER HOSPITALS.

Surname of Patient.	Medical Attendant.	Date of Transfer.	Reasons for Transference.
(1) _____	_____	_____	_____
(2) _____	_____	_____	_____
(3) _____	_____	_____	_____
(4) _____	_____	_____	_____
(5) _____	_____	_____	_____
(6) _____	_____	_____	_____

FINAL RESULTS TO PATIENTS TRANSFERRED TO OTHER HOSPITALS

N.B.—Matrons must ascertain the final results to all patients transferred from their hospital to another institution, and must enter such result in the next monthly form which they fill up—*i.e.*, on the first occasion possible.

Surname of Patient.	Date of Transference.	Reason for Transference.	Recovered.	Died.
(1) _____	_____	_____	_____	_____
(2) _____	_____	_____	_____	_____
(3) _____	_____	_____	_____	_____
(4) _____	_____	_____	_____	_____
(5) _____	_____	_____	_____	_____
(6) _____	_____	_____	_____	_____

MATERNAL DEATHS.

Name of Patient.	Medical Attendant.	Date of Death.	Cause of Death.
(1) _____	_____	_____	_____
(2) _____	_____	_____	_____
(3) _____	_____	_____	_____
(4) _____	_____	_____	_____
(5) _____	_____	_____	_____

Signed :

N.B.—It is essential that this form shall be filled in correctly. Any Matron, who finds a difficulty in so doing, will please apply at once to the Nurse Inspector for instructions.

When the answers to questions are figures, please use figures and do not write the numbers in words.

If the answer to any question is 0, this figure must be shown on the form, as replies must be entered to all the queries and no blanks left.

fever, or from any sickness the symptoms of which create a reasonable suspicion that such sickness is puerperal fever, shall notify the licensee or manager at the earliest possible moment of the existence of such fever or sickness.

“(15) When notified as provided in the preceding regulation hereof, by the medical practitioner in attendance, that puerperal fever exists or is suspected to exist in any private maternity hospital, the licensee or manager shall promptly notify every medical practitioner attending or engaged to attend any patient either in the private maternity hospital or proposing to enter that hospital during the two weeks next following such notification. If no medical practitioner is engaged to attend, then the licensee or manager shall notify every patient who proposes to enter the hospital during such two weeks.

“(16) In every private maternity hospital which is licensed to admit fifteen patients, or more than fifteen patients, there shall be such provisions for the isolation of patients as the Medical Officer of Health may approve.”

To ensure the effective carrying out of the Regulations each hospital is visited at intervals by the Nurse Inspector of the local Health Office, and is inspected at intervals by the Inspector of Hospitals. Moreover, a monthly return of the work done in the hospital is sent each month to the local Medical Officer of Health. This return is in the form on pp. 119, 120.

Copies of every return are also sent to me for my examination, and I, through the Medical

Officers of Health, enquire into all cases in which enquiry seems likely to lead to any improvement.

In New Zealand three conditions are recognised which call for action on the part of the matron of a hospital or of the attending practitioners. These are: "Puerperal Morbidity," "Puerperal Pyrexia" and "Puerperal Fever."

Puerperal morbidity is deemed to be present in the lying-in woman, if at any time during her stay in hospital, before or within twenty-one days after childbirth, she has suffered from a febrile condition in which her temperature has risen to 100° F., or more on any two occasions, or has been sustained at 100° F. or more during a period of twenty-four hours.

Puerperal pyrexia means any febrile condition (other than a condition which requires to be notified as puerperal fever) occurring in a woman within twenty-one days after childbirth or miscarriage, in which a temperature of 100.4° F., or more, has been sustained during a period of twenty-four hours, or has recurred during that period.

Puerperal fever is the official misnomer for puerperal septicæmia and puerperal sapræmia. I call it "misnomer" because it is an unfortunate term that suggests that septicæmia occurring during the puerperium differs from septicæmia occurring at other times, and that it is a specific disease peculiar to lying-in women. However, custom and statisticians have sanctioned its use.

Puerperal morbidity is not notifiable. A record of the cases in which it occurs must be kept by the licensees of maternity hospitals, and the numbers

thereof reported monthly to the Medical Officer of Health. If he found a high morbidity rate in any hospital he would regard it as a reason for its inspection, on the result of which the necessary measures to be taken would depend.

Puerperal pyrexia is compulsorily notifiable by the licensees of maternity hospitals. Notification by medical practitioners is not required.

Puerperal fever, or a reasonable suspicion of the existence thereof, is compulsorily notifiable by medical practitioners in all cases.

It would seem at first sight that it is an easy matter for the people concerned to comply with these Regulations, but unfortunately there is a tendency for all efforts to lessen puerperal sepsis to produce a vicious circle which nullifies them.

For example—to prevent sepsis in private maternity hospitals, arrangements are made by the Health Authorities whereby certain conditions of temperature become notifiable. Notification is followed by official inspection and disinfection of the affected wards. In extreme cases the hospital is closed. The public say that there is something wrong, and refuse to send their wives to the hospital. The matron-owner loses her livelihood, at any rate temporarily. She decides that such a thing shall not happen again and possibly begins to fake the temperature charts. Sepsis again becomes established in the hospital. It is true that there is a further stage probable. Deaths from sepsis occur and the condition of the hospital, the faking of the charts, and the responsibility of the matron are discovered.

Again, it not infrequently happens that in the early stages of an infection, the usual morning and evening temperatures may not show any evidence of pyrexia, but that, if the patient is put on a four-hourly chart, pyrexial periods are obvious. At once the economic interests of the licensee of the hospital and her duty to her patients clash. If she confines herself to taking bi-daily temperatures, the existence of pyrexia may escape notice. If she takes them four-hourly, her hospital may be subjected to disinfection or even be closed.

An otherwise very reliable matron said to me once: "Why should I take a four-hourly temperature? It is not laid down in the Regulations, and its result may be the closure of my hospital." A most reliable matron of a public maternity hospital openly sponged her patients before taking their temperatures if she thought the latter was likely to be above 100° F., and she saw nothing wrong in the practice.

The patient goes home with a record of normality, and develops an acute pelvic cellulitis. The other patients are exposed to the risk of an infection which has been lying semi-dormant.

All this works back to the same thing. The economic success of the hospital is at variance with its strictly conscientious working, and maternal mortality results. I can see no solution to the problem except to bring maternity hospitals under a system which makes them independent of the economic factor. As things are, "the best laid schemes" of Departments and of individuals "gang aft aglee."

The position is a very difficult one. We must sympathise with the misfortunes of the matron. She is the victim of circumstances. It may not be her fault that infection has first appeared in the hospital, but, none the less, it must be driven out. In the process her hospital must be temporarily regarded as unclean, but this does not entitle public opinion to place a stigma on it after disinfection is complete. Once, however, she begins to fake the hospital records she places herself outside sympathy. She is deliberately committing a medical felony, and a medical practitioner, who knows what she is doing and continues to send patients to her hospital, is compounding such felony.

In order to stop the spread of sepsis, notification and disinfection, and even the closure of hospitals are necessary. The resultant economic disturbance is unavoidable. These things are done for the public good, as in the case of any other infectious disease, and I think that, this being so, the public should in some way compensate the victim. It is difficult to know how such compensation can best be given. Compensation for the partial or complete closure of a private maternity hospital might be given.

The special Committee of the British Medical Association on maternal mortality recommended that compensation should be given to midwives who have been compelled to cease work owing to contact with septic cases, and this recommendation has already been carried into effect. It is difficult to grant such compensation, and logically to refuse it

to the midwife-owner of a hospital. At the same time to grant it might easily lead to abuse. I would prefer to see some arrangement by which prospective owners of maternity hospitals could be guided at the beginning of their career. There should be someone who would stop them trying to make a hospital in a derelict private house, without sufficient capital either to begin or to continue it. There should be some means by which the various hospital essentials could be bought at wholesale prices, for example a Government store of hospital requisites. The present position of these people is an economic impossibility, and one which directly reacts on all efforts to combat septic infection.

The private maternity hospitals of New Zealand are far from the standard I have suggested, still, thanks to the constant and conscientious work of Dr. Paget, Inspector of Hospitals, and of the various Medical Officers of Health and Nurse Inspectors, their condition has, during the past five years, been distinctly improved.

The aggregation of patients in maternity hospitals is always accompanied by an increased risk of sepsis, and, while it is possible to reduce that risk very considerably in the manner I have described, it is not possible wholly to abolish it. On the other hand, the well-equipped maternity hospital should lessen the other risks of childbirth. It should provide a place in which necessary operations can be performed more satisfactorily and safely than in a private house, and where complications can be correctly and swiftly treated. "Perhaps its most

incalculable benefit lies (or should lie) in saving the patient from the obstetric forceps. Removed from anxious relatives, under the constant observation of a staff to whom time is no object, and in which an atmosphere of calm routine prevails, nature, who after all is not a bad midwife, is allowed a hand.” (Davy.)

I think we may assume that the advantages offered by a maternity hospital properly built, equipped, and managed considerably outweigh its disadvantages, and that it may be regarded as a positive factor in the reduction of maternal mortality. If, however, it is regarded merely as a place where unnecessary interference with the course of labour is facile and permissible, where the principles of midwifery are replaced by the half-assimilated principles of surgery, and where the standard of asepsis may be lower than that adopted in opening an abscess, then the maternity hospital must be regarded as a positive factor in its increase.

I confess that personally I do not see that, between the private maternity hospital, built, equipped, and managed as it should be, and the private maternity hospital, built, equipped, and managed as it is to-day, there is a satisfactory half-way house which can be regarded as a sound temporary expedient until our ideals are reached. I think it is ineffectual to improve buildings and to neglect equipment and management, and by the latter I mean both the management of the hospital and the conduct of the labour. It is equally ineffectual to improve equipment alone, and even the conduct of labour on

the most approved principles will not suffice if environment is wrong. I am myself entirely in favour of the hospital which is built, equipped, and managed on proper lines, and I confidently look forward to the universal establishment of such.

The difficulty of dealing with hospitals already in existence is considerable. It is largely an economic matter in which the risk to human life and health must be weighed against increased expense. It is of course cheap and obviously dishonest claptrap to say that human life must always outweigh all financial considerations. Human life has a definite economic value, and if that value is placed too high there will be a reaction, the effect of which may easily be more prejudicial to life than the cause of mortality which it was intended to remove. In the present case, however, if we put maternal life and its economic value on one side, and the cost of compensation for existing rights and of the creation of new hospitals on the other, I do not think the scales would be too heavily weighed down on the purely economic side. Further, once the initial expenses were overcome, the new hospital ought to be almost, if not quite, self-supporting.

I make these remarks as a warning to other countries where private maternity hospitals are either few or non-existent in order that, when such hospitals are created, they may be of a type that is both obstetrically and economically possible.

CHAPTER VI

ANTE-NATAL CARE

WHEN we come later to consider the chief factors in the causation of maternal mortality, we shall find that one of the most important of them is lack of proper care during pregnancy. I use the word "care" in its widest sense—in fact, perhaps I widen it somewhat beyond its proper meaning. It is intended to include all the measures that are necessary, firstly, to give the woman the information that will help her to live a normal and therefore a healthy life; secondly, to diagnose the presence of any complications, either ovular or maternal, which may affect prejudicially the course of a pregnancy or of labour; and, thirdly, to treat these complications under the most favourable conditions and in the most satisfactory manner. All these proceedings I include under the one term "care."

In the past, in spite of the efforts of the late Dr. Ballantyne, the importance of ante-natal care has been overlooked to an extent that, now its importance is recognised, is almost incredible. Still that recognition, though yearly becoming wider, has not yet reached many whose profession should give them a clearer vision, while the blindness of the general public to a matter which so closely concerns its own health and interests is almost incredible. The

maternal instinct when the welfare of its young is at stake is usually strong, and often it is right. When, however, matters affecting the welfare of the married daughter arise, it seems to break down in a manner which would be inexplicable if we did not recognise how it is tied by the fetters of tradition. It is rather terrible to think how many women die annually of eclampsia because their mothers told them that *they* had never fussed about doctors and diet during pregnancy, or how many difficult, dangerous, and even fatal labours occur because the mothers decried the necessity for ante-natal examination.

I propose to divide ante-natal care under three heads—information, diagnosis, treatment.

Information. — The ignorance of the average woman regarding the ordinary essentials of pregnancy is marvellous, and its consequence is that no detail of importance can be regarded as too obvious to discuss.

The Health Department of New Zealand has issued a pamphlet of “Suggestions to Expectant Mothers.” A list of the subjects discussed in it will give a general idea of what is usually necessary. They are as follows: Domestic and personal hygiene; food, including the outlines of a daily diet; the use of fluids; the treatment of constipation and morning sickness; the care of the teeth; clothing; exercise, rest, recreation and work; Special exercises for developing the abdominal muscles; sleep; danger signals in pregnancy; the care of the breasts.

The pamphlet then goes on to discuss the

necessary preparation for labour, but as these deal mainly with sterilised outfits, etc., I shall leave them until I am considering the aseptic management of labour.

In addition to instruction in the subjects mentioned above, the woman, from the very beginning, must be got to understand that, while pregnancy is usually a normal condition, her systemic balance can be more easily upset than during the non-pregnant state. In other words, she must be made to realise that, to keep this balance normal, she must not allow abnormalities of life which, prior to pregnancy, she could permit with impunity.

The human mode of life is largely artificial. Diet, occupation, hygiene, surroundings are all very different from what they would be in a more primitive state. Under ordinary conditions the normal human system is capable of accommodating itself to the demands of civilisation, and still preserving its balance. When, however, pregnancy comes, powers of accommodation become more strained, balance is more precarious, and the scales of health and illness may readily come down on the wrong side.

It is this which makes attention to the ordinary details of normal life of such extreme importance to the pregnant woman, and which explains why it is necessary that she should receive advice and instruction.

Diagnosis and Treatment. — Ante-natal diagnosis concerns itself with conditions that may affect the health and welfare of either the woman or the ovum during pregnancy or labour. In regard to the

woman it must range so widely as to include such diverse conditions as cardiac disease and contracted pelvis, and in regard to the ovum as vesicular mole and malpresentations. In other words, it must concern itself with everything that may bring about a state of health and of function that is prejudicial to the welfare of either pregnancy or labour. I will discuss treatment with diagnosis because the two are interwoven.

A pregnant woman must be made to realise that she must consult her medical adviser as soon as the existence of pregnancy is established in her own mind, that is to say, shortly after the first menstrual period has been missed. His enquiry should be exhaustive in regard to all matters that may subsequently affect the pregnancy or the labour. The directions in which it should turn are as follows :—

- (1) General health and well-being.
- (2) The possibility of systemic disease—cardiac, renal, pulmonary, etc.
- (3) The existence of any gross bodily deformity or anomaly.
- (4) The presence of any of the minor disorders either peculiar to, or independent of, pregnancy, *e.g.*, constipation, urinary frequency, indigestion, etc.
- (5) The physical examination—(a) general, (b) special, *i.e.*, in relation to the condition of the pelvic organs and the bony pelvis.
- (6) Past history, and especially the history of past pregnancies and labours if the patient is a multipara.

It is unnecessary to enter into any of these matters

except the last two, *i.e.*, the history of the patient as regards past pregnancies, and the physical examination in relation to the pelvis and the organs it contains.

The probable course of labour can, in regard to certain matters, be prejudged by two indications, which indicate to the practitioner the possibility of future safety or danger. The first is, in primiparæ, the relation of the presenting part to the pelvic brim shortly before or at the beginning of labour. The second is, in multiparæ, the history of past labours. Many lives—both maternal and foetal—have been lost from overlooking the importance of these indications, and very many more women have had their health permanently or temporarily injured. Moreover, the possible after-consequences, to the mental welfare of a child whose head has been dragged through a narrow pelvic brim, must also be taken into account. Consequently, the extreme importance which attaches to the questions—What is the relation of the head to the pelvis? What is the history of previous labours?

Suppose the answers show that the head is not fixed, or that there is a history of difficult labour, operative midwifery, dead children—what is the next step? The obvious answer is—internal examination and external pelvimetry, with the object of ascertaining the presence or absence of *gross* pelvic deformity. The practical outcome of this examination is not of great importance unless the information obtained is very definite, because usually its results are too inexact to be of value.

Whatever they may be, internal pelvimetry will also be necessary, and, while the detection of the positive indications of contraction will strengthen our position when insisting on such measurements, its absence must not be allowed to weaken our demand for it.

One of the most amazing tendencies of modern midwifery is the inclination to decry the value of accurate internal pelvimetry and to replace it by external pelvimetry, and to assume that the unaided human fingers are capable of taking exact internal measurements and the human mind of correcting and adjusting them without, in many cases, any experience to help either the one or the other.

Suppose a cabinet-maker wanted to fit a drawer to an existing cabinet. Would he take the external measurements of the latter and estimate therefrom the inner, or would he directly measure the inner? Yet the former course is adopted every day in regard to pelvimetry, even by people who ought to know better. Let us suppose these people have acquired a skill which enables them, by virtue of their experiences, to estimate distances by the help of indirect measurements. Does this entitle them to teach others, who have not had and who never will have the same experience, to do so too? A dispensing chemist can estimate within half a drachm by his eye the amount of water that will measure 8 ozs. Will he trust his assistant to do the same? Yet regularly medical practitioners are turned out from medical schools and told to go and estimate the prospects of their patients' life or death

with fingers which have not even had a carpenter's education.

I have before me too many records of unnecessary maternal deaths directly due to failure to take internal pelvic measurements, with the sequence—failed forceps, failed craniotomy, Cæsarean section, sepsis, death, to allow me to condone such teaching.

I have criticised previously the general practitioner in certain aspects of his relation to midwifery. I am now criticising the specialist who has given him such teaching as he has had. Did the specialist teach that amongst the most serious complications of labour was contracted pelvis, and that the danger of the milder degrees was even greater than that of the severer, because their recognition was more difficult? Did he tell him that early diagnosis was essential, that its accuracy was equally essential, and that the treatment of these cases was beyond the skill of the general practitioner who had not had considerable experience of such? Or did he say—"suspected contracted pelvis—external measurements nearly normal—give the patient a trial labour."

I shall discuss trial labours later. Here it is enough to say that, to paraphrase Mr. Kipling—

"What's excellent in London town is death in Malabar."

I must get back from my diversion. At the initial examination of the pregnant woman the possible gross deformities of the pelvis are sought by vaginal examination and external pelvimetry. Should their results, or the history or appearance of the

patient, suggest the possibility of contraction, internal pelvimetry must be carried out later, *i.e.*, about the end of the fifth or sixth month, when the uterus has risen out of the pelvis and is clear of the promontory.

Putting aside for the moment contracted pelvis, we come to the other aspects of pelvic examination. The two matters, which most commonly call for attention in the early months, are the position of the uterus, and the presence or absence of any potentially or actually septic discharges from vaginal or cervical disease.

The position of the uterus is of importance, because unless backward displacements are corrected, the risk of abortion is increased, as is also the discomfort of the patient. The recognition of septic discharges—of gonococcal or other origin—must so far as possible be effected before labour occurs. All purulent discharges should be examined bacteriologically, and treated according to their nature. With the details of this treatment I am not concerned. Backward displacements must be corrected, and *then* kept in place with the smallest-sized Hodge or Smith-Hodge pessary that will do the work. Rubber rings are unsuitable for the purpose.

The practitioner will remember that, before diagnosing the existence of a backward displacement, the bladder must be empty, otherwise mistakes are frequent. The pessary can be removed permanently about the end of the fourth month, and should in the meantime be removed monthly for cleaning.

Further examination reveals, or excludes, uterine or ovarian tumours and any of the other rarer complications of pregnancy.

The consequences of the examination depend upon its results. If the woman is in normal health, she should be given the advice I have already suggested, and told to return, if everything goes on normally, about the fifth month. From that time urinary examination must be carried out at regular intervals, at first fortnightly, later weekly, and still later—in some cases—even daily. The patient can bring or send specimens for examination. They will suffice so long as they remain normal, but, should albumen appear, the examination of a catheter specimen must precede its treatment. I have little doubt that numerous women have been condemned to rigid diet, because an albuminous discharge had contaminated a specimen of urine passed spontaneously. The existence of pyelitis, as a cause of albuminuria distinct from toxæmia, must not be overlooked.

I am afraid it must be accepted as a fact that, while regular urinary examination will markedly help to reduce the frequency of eclampsia, it will not wholly prevent the occurrence of even fatal cases. Personally, I used to hold the opposite view, and to consider with Ribemont-Dessaignes that eclampsia occurred exclusively in women whose urine had not been examined during pregnancy. This statement, assuming “examination” to mean regular examination, is very nearly true, but not quite. I have at least one accurate record of fatal eclampsia in a

patient whose urine had been regularly examined and proved free from albumen up to two days before onset of the fits.

Beyond the above-mentioned urinary examination there is little further to attend to, in the case of the normal patient who is leading a normal life, until the last fortnight or so of pregnancy. At this time the question of presentation, and, in the case of primiparæ, of the relation of the head to the pelvis, becomes urgent. Malpresentations must be treated in accordance with their nature. Sometimes it may be possible to correct them in such a manner that they remain corrected when labour begins. More often it is impossible to keep them corrected until labour has begun, and merely irksome to the patient to try. These are common matters of treatment with which I am not here concerned.

If the patient is a primipara, and the presenting vertex is still free above the brim during the last ten days or so of pregnancy, it is almost as significant a sign as is a history of difficult labours. It signifies, in most cases, positively, if we exclude such conditions as hydramnios, foetal anomalies, and placenta prævia, that there is some disproportion between the presenting part and the brim. The woman, whose medical attendant does not recognise the urgency of the sign, comes into the second stage of labour with some ninety per cent. of the value of his assistance lost.

It is unnecessary to repeat arguments already stated. The non-fixity of the head, at a time at which it ought to be fixed, is almost as certain a sign

of disproportion as is a history of previous pregnancies, and therefore it must be treated with the same serious respect. Unless it is obvious that the disproportion is due to the size of the foetal head, pelvimetry is immediately indicated in order to decide the correct line of treatment to adopt. If it is at all possible to do so, the patient should be transferred to the care of a specialist. If this is not possible, she should at least be placed where any necessary operative procedure can be carried out under suitable conditions.

If it was possible to ensure that these two procedures—diagnosis and suitable treatment—were carried out in every case which required them, the immediate reduction in maternal mortality would be appreciable. At present, however, the possibility is wanting, and while men often strain at the gynæcological gnat, they swallow wide-mouthed the obstetrical camel. A similar œsophageal inconsistency is to be found in our absorption of the relative needs of gynæcological and obstetrical asepsis. How many practitioners carry out similar aseptic detail at a confinement that they would at a curetting?

I have so far suggested two things about internal pelvimetry: Firstly, that, if the possibility of contracted pelvis is recognised at the beginning of pregnancy, it should be carried out at the beginning of the sixth month. Secondly, that, if such possibility is only recognised shortly before term, it should be carried out immediately.

I have mentioned my reason for postponing measurement in the first instance—because the uterus

is in the way, but I have not explained my reason for selecting the sixth month in preference to full term. Put shortly it is that, unless the nature and degree of contraction is recognised about the middle of pregnancy, the possibility of adopting one of the most satisfactory methods of treating certain degrees of pelvic contraction is lost.

Prophylactic pubiotomy, as a method of reducing the dangers of labour in contracted pelvis, was introduced by me in 1918 or 1919. I am now a little sorry that I am responsible for its introduction, because, if I had not been, I could express my opinion regarding it without being hampered by the feeling that I was prejudiced in favour of my own offspring.

I trust that no one will think from the above that I claim any connection with the introduction of pubiotomy. Such a claim would be too absurd. I think, however, I was perhaps the first person to call attention to the advantages of "prophylactic pubiotomy" done some weeks or months before labour with the object of causing a permanent increase in the size of the pelvis. I regret that so few people have tested for themselves the views I expressed.

Pubiotomy is an operation which has suffered to an extraordinary extent from the criticisms of those who know nothing about it. "We all know that it's a rotten operation," said an eminent authority with a wave of his hand. But—had he ever tried it, or seen it tried, or considered the expressed opinions of those who had done both?

Here I do not propose to discuss further its merits

and demerits. I content myself by saying that my friend Dr. Lindsay, Gynæcologist to the North Canterbury Hospital in New Zealand, has had considerable opportunities of testing my views, that he has done so, and that his results both immediate and remote practically coincide with those which I obtained at the Rotunda Hospital. In other words, that he, like me, has found the operation capable of bringing about a safe and easy termination to the individual pregnancy concerned, and of causing in the size of the pelvis a permanent increase which enables normal delivery to occur in subsequent labours. In my present remarks I propose to regard the prophylactic operation as a recognised method of treatment.

The object, then, of measuring the pelvis early in pregnancy is to determine if the case is suitable for pubiotomy, and, if so, to do the operation at what I conceive to be the time of election, *i.e.*, between the 26th and the 30th week of pregnancy. The reason for its early performance is that all injury to the tissues round the saw-cut may be healed before labour occurs.

There is one essential to the success of the operation, and it is that all idea of promoting bony union and all fear of subsequent impairment of the patient's powers of walking must be put aside. The object is to prevent bony union, and to favour the permanence of a considerable gap between the bones. The fear of subsequent difficulties in walking is groundless.

In selecting cases for operation a lower limit must

be fixed. Pubiotomy should not be done in a flat pelvis whose true conjugate measures less than 7 cm., or in a generally contracted pelvis in which it measures less than 8 cm. Below this the danger of causing injury to the sacro-iliac joints during labour is present, and this, so far as I know, is the only condition that will cause subsequent trouble.

I am not inclined to fix an upper limit, but rather to say that any case in which labour is likely to be or has proved to be difficult and dangerous owing to certain types of pelvic contraction is suitable for the operation provided the lower limit is not crossed.

Pubiotomy at full term is another matter. In a multipara with a dilated vagina, it is probably permissible at any stage. I do not like the operation in primiparæ because of the risk of extensive tearing of the vagina.

When I paraphrased Mr. Kipling and wrote regarding "trial labour"—

"What's excellent in London town is death in
Malabar"—

I meant to suggest that what may possibly be safe and advantageous in a well-equipped maternity hospital, where the patient is under constant and skilled supervision, is neither the one nor the other when she is under the care of a single general practitioner in a remote district. Trial labours have no place under such conditions. Moreover, I entirely disapprove, under any conditions, of compelling the patient to test for herself the degree of disproportion between the head and the pelvis, unless previous exact measurement has shown that such

disproportion is too slight to offer a bar to a successful labour.

Therefore, I am only inclined to regard a trial labour as permissible in the upper limits of the first degree of pelvic contraction. Its lower limits are particularly receptive of the advantages of pubiotomy.

With the management of a trial labour I am not concerned. This is not a book on obstetrical treatment. If I have wandered into it, it is because I think pubiotomy has been neglected, not because its neglectors have disproved its advantages, but because tradition has told them that—"It's a rotten operation." If anyone will compare the known risks and results of pubiotomy, done as I have suggested, with the known risks and results of prolonged and difficult labour, high forceps, failed forceps, craniotomy or Cæsarean section done after infection has occurred, I think he will understand my objection to a "trial labour" that may fail.

Ante-natal diagnosis affects the treatment of other complications than contracted pelvis. Placenta prævia is one of them. If ante-natal care and diagnosis enable us to recognise a low insertion of the placenta after the child is viable, and before serious bleeding has occurred, then Cæsarean section is a permissible treatment in order to save the mother from hæmorrhage and the child from death. It may even be possible to keep the patient at rest under constant supervision, and to postpone the operation until a few weeks nearer the maturity of the latter. On the other hand, I cannot regard Cæsarean section as a suitable procedure after hæmorrhage, sufficient

to place the mother in danger, has occurred, and when the fœtus is already either moribund or dead. Consequently, ante-natal care and diagnosis tends to simplify the treatment of a very serious complication.

Accidental hæmorrhage is in a different position. There is nothing to diagnose until bleeding actually occurs, and, when this has happened, I think the usual obstetrical treatment is the correct one to adopt.

There is another point to which I may draw attention, as I do not think it has received the consideration it merits. Ante-natal care and diagnosis are concerned chiefly with the existing pregnancy and its consequent labour, but they also indirectly affect the welfare of future pregnancies and labours. If ante-natal diagnosis shows that a woman is structurally and organically normal, and if her subsequent labour confirms this, there is a strong probability that future pregnancies and labours will be normal too. On the other hand, if the reverse is found, if structural or organic defects exist, or if the labour is abnormal, it suggests, in some cases positively, that trouble will also occur in the future. If a patient remained under the care of the same practitioner, he would know her history and expect trouble. Patients, however, wander from place to place, and from practitioner to practitioner. They very seldom appreciate the importance of remembering the details of a previous pregnancy. Consequently, their new medical attendant is ignorant of details, the knowledge of which is essential. The state of matrimony is protected by religious or legal certification. It would go a long way towards lessening maternal mortality if the state of labour was similarly pro-

tected by medical certification, and if there was a moral, or even legal, obligation on the practitioner, who attended a woman in her first pregnancy and labour, to give her a short statement of the important facts of her case. Once women became educated to the value of such a certificate they would keep it, and give it to their new attendant as occasion arose. In this way the latter would begin the care of his new patient possessing an essential knowledge of her past obstetrical history.

I may perhaps sum up the advantages of ante-natal care as follows :—

- (1) It enables the healthy woman to keep healthy.
- (2) It enables the woman who suffers from the minor ailments of pregnancy to escape the consequences which their neglect and aggravation may cause.
- (3) It enables some of the grave complications of pregnancy in great part to be prevented.
- (4) It enables some of the most serious complications of labour to be foreseen, and to be treated under the most favourable conditions, or even to be removed.

In consequence, we may positively consider that ante-natal care is one of the most important factors in the reduction of maternal mortality.

THE ANTE-NATAL CLINIC

The ante-natal clinic is rapidly becoming an essential part of all efficient maternity hospitals, and the teaching it affords plays an essential part in the education of maternity nurses, midwives, and medical students.

In its best form, it is under the direct control of an obstetrical specialist. If, however, the number of patients is too great for him alone to manage, he must delegate the care of the less important patients to an assistant medical officer or to a midwife who has been trained in ante-natal work.

As ante-natal clinics have become a feature of the larger maternity hospitals in this country, a short account of the manner in which they work may be of interest. The account I give is almost wholly the work of Dr. Elaine Gurr, who has been largely responsible for the establishment of these clinics.

An ante-natal clinic has been established in connection with all the large maternity hospitals of New Zealand, and is gradually being extended to the smaller public hospitals. Although a part of the hospital, it is usually so placed as to have a separate entrance and to be kept distinct from the hospital proper.

An ante-natal clinic should contain an office, a waiting room, an examination room, dressing cubicle, and a laboratory. The examination room is sometimes divided up by wooden partitions into cubicles, but where there is a class of students or nurses, a single large room is preferable. It is well to reserve one cubicle and dressing room for patients who may suffer from septic conditions. The provision of a laboratory is a stimulus to research.

For convenience of working, the clinic is divided into two sections, one under the care of the house surgeon or ante-natal sister, and the other under the direct supervision of the obstetrician in charge, who attends the clinic at least twice a week on stated

days. All patients who are abnormal, or who are attending the clinic for the first time, or who are in the last month of pregnancy are referred to the obstetrician for examination, and, if necessary, treatment. Further, all patients, in addition to previous examinations, are examined by him during the thirty-sixth week of pregnancy. After this time, vaginal examinations are not made unless there is some definite indication. In such cases, the aseptic technique must be as rigid as at the beginning of labour.

All normal patients are examined and advised at regular intervals by the house surgeon or the sister in charge.

The key to the success of the work lies to a great extent in the hands of the sister in charge. The most important work of the clinic is to prevent or anticipate complications during pregnancy and labour, but to regard this as its whole purpose is to lose a large part of its possibilities. It is essential that the patient should find a sympathetic atmosphere, in order that she may learn to view the clinic as an advisory centre where her various troubles are always willingly considered. Classes for instruction in mothercraft may be arranged, but they cannot replace informal and individual advice.

Patients are encouraged to attend the clinic as soon as they realise they are pregnant, then once a month up to the seventh month, and then fortnightly or weekly in the last month. Each time they bring with them a sample of urine. If this specimen is abnormal, a catheter specimen must be obtained and examined at the time of the visit.

With the exception of emergency cases, no patient should be admitted to the hospital unless she has attended the ante-natal clinic. In order to ensure her regular attendance, she is given an attendance card when she books, on which is entered the date of her first visit. In addition a standard chart is filled in for each patient, so that there may be uniformity in record and in examination, and that the former may be complete.

During the patient's first visit to the clinic, detailed instructions are given her by the ante-natal sister regarding the subjects which have been already mentioned in this chapter. Printed suggestions for the use of expectant mothers are supplied, and also directions for the preparation of a sterilised maternity outfit.

The nature of the information which is obtained and entered on the chart may be judged from the following :—

I. Past history :—

(1) Of previous disease.

(2) Of any previous surgical conditions or accidents, especially abdominal and pelvic conditions.

(3) Of menstruation.

(4) Of past pregnancies and labours.

II. Present history :—

(1) Date of last menstruation and probable date of labour.

(2) General symptoms and course of pregnancy.

III. Results of urine analysis.

IV. Physical examination, with special reference to disease or deformity.

V. External pelvimetry, and obstetrical diagnosis if pregnancy is sufficiently far advanced.

A patient who is referred to the obstetrician for examination brings her chart with her, which has been written up to date. Her clothing has been removed except her vest, shoes, and stockings, and she wears a dressing-gown supplied by the institution. Her shoes are unfastened, and her stockings are turned down to the ankles. Her temperature, pulse, and weight have been taken, and the urine has been examined. The examination couch is arranged with under-blanket, sheet, draw-sheet, pillow and detachable paper pillow cover, and a blanket enclosed in a sheet to cover the patient.

The following procedure is adopted :—

- (1) The blood pressure is taken.
- (2) Any disease or abnormality of the body is noted.
- (3) Abdominal palpation and general examination, and auscultation are carried out.

(4) If the external pelvic measurements are abnormal, or if the history or appearance of the patient suggests the possibility of a contracted pelvis, the oblique diameter and the diameters of the outlet are measured, and the pelvic brim palpated so far as possible. If these suggest contraction, internal pelvimetry is done on a subsequent occasion, with an internal pelvimeter and under an anæsthetic, and the diameters of the pelvic brim are thus ascertained.

- (5) Any necessary tests or examinations are made in cases of suspected venereal disease.

In the case of a patient who attends the ante-natal clinic and has her own medical adviser, the sister-in-charge acts entirely as an assistant to such adviser, and carries out any instructions regarding treatment that he may wish to give. After the first visit, a copy of the patient's clinical chart is sent to him, and she is referred to him for a medical examination. Should he wish the patient to attend the clinic regularly, he is from time to time advised as to her condition.

CHAPTER VII

THE GENERAL MANAGEMENT OF LABOUR AND THE PUERPERIUM

I PROPOSE to divide the consideration of the general management of labour and the puerperium from the point of view of reducing maternal mortality into the following sections :—

- I. Aseptic technique.
- II. The avoidance of interference.
- III. General management of labour.
- IV. The puerperium.

THE ASEPTIC TECHNIQUE OF LABOUR AND THE PUERPERIUM

As a preliminary to the consideration of the aseptic technique of labour, I am going to make certain assumptions which I propose to regard as facts. These are as follows :—

(1) That bacteria which cause fatal sepsis, *e.g.*, hæmolytic streptococci of a virulent character, are, in the vast majority of cases, introduced from outside the genital tract, that is to say, they are not present in the vagina, uterus, or tubes prior to labour. Naturally, I exclude cases of pre-existing acute infection of the vagina.

(2) That, on the other hand, organisms which cause local sepsis, *e.g.*, gonococcus, staphylococcus aureus and albus and streptococci of low virulence,

may be present in the vagina and cervix, but that, with the exception of the gonococcus, they are usually introduced from without during or shortly before labour.

(3) That, in consequence of the general prevalence of organisms of both high and low virulence, strict asepsis is necessary during labour, both because the genital tract after labour provides an excellent site for bacterial growth, and because the uterine cavity, and especially the placental site, furnishes a more open port for entrance into the blood or lymphatic system than any ordinary traumatic or operation wound.

(4) That aseptic technique as usually carried out in obstetrical practice is worthless, seeing that it falls far below the standard adopted in the smallest surgical operation.

It is not possible here to labour these assumptions. I give them as expressing my own views—views which I believe I may take as generally recognised by thinking persons. Perhaps it would be sufficient if I tried to indicate the possible sources of infection and the manner of its introduction. It seems to me that the commonest sources of infection are as follows :—

(1) The outside of the patient's body, when any form of pyogenic infection exists thereon, *e.g.*, boils, syphilitic sores, etc.

(2) The inside of the patient's body, when infection exists therein, *e.g.*, suppurating teeth, pyelitis, pulmonary infection, etc.

(3) Septic discharges in others coming from the

septic forms of influenza, suppurating wounds, local septic conditions as of the teeth, ears, nose and throat, skin, septic colitis, etc. Such discharges being brought to the patient directly by the person infected or indirectly by a third party.

(4) Septic discharges brought to patients in maternity hospitals during or shortly before labour from patients in the lying-in wards, or, more rarely, after labour from a similar source.

It is probable that, in every case of external origin, the organisms are carried into the vagina on something that is introduced into the genital passages from without, and that the higher the introduction the more likely is infection to result. By this I mean, firstly, that infection by direct extension from the vulva to the vagina occurs so rarely as to be negligible, and, secondly, that the nearer the placental site the organisms are deposited the greater is the danger—other things such as virulence, dose, etc., being equal. Examining fingers, instruments, douches, swabs, coitus, and bath water must all share with other factors the responsibility of being the possible vehicle. The part played by each of them, with the exception of coitus and bath water, is well recognised. The importance of the last two, however, is coming into increasing prominence, and in some places coitus, or any form of hip or immersion bath, is forbidden for some weeks before labour. Personally, I regard bath water as a very possible, if not probable, cause of infection, particularly in the case of maternity hospitals where the same bath serves both ante- and post-natal patients. Moreover, even if

the asepsis of the bath can be guaranteed, there is the condition of the patient's skin to be considered in view of the prevalence of various types of skin infection. The dirtier the patient and the more she wants a "lying-down" bath, the greater is the risk of infection. Consequently, the plea, that some patients are so dirty that they cannot be washed in any other way, must not be allowed to prevail. Besides, the plea is incorrect. A dirty patient can be washed just as completely when she is standing in hot water in a bath, or sitting on a bath seat with her feet in water, as when she is washed lying down, or sitting in the water.

The Health Department has in New Zealand forbidden "lying-down" baths in the hospitals under its direct control, with results that seem to confirm the wisdom of the step. I hope that shortly "lying-down" baths will also be forbidden in all other hospitals, public or private. Amongst the other places where the practice is forbidden is the Canton Zurich in Switzerland, in which, under the provisions of a Public Health Act for the prevention of complications in the puerperium, the practice has been prohibited. The position there, as related in a brief pamphlet by Professor Walthard, Director of the Gynæcological Clinic of Zurich, is as follows:—

"We are almost sure that the microbes that cause puerperal fever can be implanted into the vagina during coitus, and by bath water and douches, etc.

"Within six weeks of implantation, either the micro-organisms are eliminated by the anti-bacterial powers of the vaginal mucosa, or the body of the

pregnant woman is capable of so increasing her power of resistance as to render them harmless.

“To prevent internal infections all women consulting the Out-patients’ Department are given the following instructions :—

“(1) Coitus is forbidden during the last eight weeks of pregnancy.

“(2) Vaginal douching is forbidden during the last eight weeks of pregnancy except by the doctor’s orders.

“(3) ‘Full-baths’ are forbidden during the last eight weeks of pregnancy in the public bath. During this time all pregnant women should wash themselves at home with soap and water, standing, but must not plunge in the bath tub.

“(4) The use of public water closets is as far as possible forbidden during the last eight weeks of pregnancy.

“Unnecessary touching of the external genitals must be avoided. If necessary, the hands must first be washed with soap and water.”

Full-baths are also forbidden in some of the Danish hospitals.

I should very much like to see these instructions universally followed.

I have already drawn attention to the danger of infection reaching labour patients from patients who have been confined (*v.* Chapter V.), and I must now repeat and amplify my former remarks.

The consequences of infection reaching the genital tract of a patient depend on certain things, of which the following are the most important :

Receptibility and resistance of the patient, dosage and virulence of the organism. A patient immediately after labour presents the maximum receptivity to any organism which may reach the genital passages. The reason is obvious. She consequently can absorb a larger dose of the infection than at other times. This means that if infection from a lying-in patient, whom I call "A," is carried to a labour patient "B," the latter can absorb such infection more readily than is the case even twenty-four hours later. Her receptivity is greater. Moreover, the infection of "A" may, so far as she is concerned, be mild and even symptomless, because she is either primarily immune to it or has gradually built up a sufficient resistance. The same infection brought to "B" may find her neither immune nor resistant, and consequently may produce a very marked effect. Her resistance is less. Further, an infection which has passed through "A" to "B," thence to "C" and to "D," may acquire a degree of virulence enormously in excess of its original virulence in "A." It is thus obvious that an infection reaching a patient in labour from the lying-in wards may cause consequences which are altogether out of proportion to those which occurred in the original patient.

The moral is obvious. All risk of infection passing from lying-in wards to the labour ward, so far as is humanly possible, must be avoided, and this can only be done when the two are distinct and separate in every way, both structurally and in regard to the appliances used in them.

I have already discussed what this means in hospital construction and methods (*v.* Chapter V.). This is the first step in the aseptic technique of labour. The second is the aseptic practice of the labour ward.

I have already definitely taken up the position that the aseptic technique of labour and the aseptic technique of surgery are one and the same thing. It is strange that at the present time it should be necessary to emphasise such an elementary fact. Unfortunately, it is necessary. There is still a very large part of the medical profession who consider that there is some strange, semi-miraculous, and very fortunate element to be found in the genital tract that renders asepsis either unnecessary or valueless.

The assumption has presumably arisen because so many women escape infection under conditions which seem to compel its occurrence. A woman is confined on the floor of a slum without any precautions and she recovers in a week, even though the child has been delivered by the forceps. Another woman is confined under really strict aseptic precautions and she gets sepsis and dies. The sceptic asks : " What is the value of your boasted asepsis ? " It is a puzzling question when two such cases form its basis. Still, that there is an answer is obvious from the results of asepsis in surgery, and what are the vagina and uterus after labour but open wounds—more or less.

It is probable that the answer is somewhat as follows : The first woman was confined under conditions of absolute dirt and she did not get

infected. Dirt does not necessarily carry septic organisms; in fact, it is far less likely to carry them than are the hands of a practitioner who has recently come from a septic case, even though he has washed them with great care. The second woman was confined under conditions of strict asepsis, and she died. I am afraid that the only conclusion that we can draw from it is that the asepsis was not strict enough—that some loophole existed somewhere through which infection entered. The fact that we do not know where the loophole was does not prove its non-existence. It is a wise cat that knows all the mouse-holes in a palace.

The finding of the loophole is not made any easier by the tendency to regard sepsis as the fault of the medical attendant or nurse, and to load them with the entire responsibility for a fatal consequence.

Theoretically, the accusation is sometimes correct. Practically, it is frequently most unjust. There are too many different factors—from the husband to the bath-water, from the bacterial resistance of the patient to her personal obedience to the advice of her medical adviser—to make it possible always to assess responsibility. On the other hand, responsibility often does lie where the public tends to place it.

I will suggest a few conditions which I think definitely attach responsibility for ill results to the medical practitioner. They are as follows:—

(1) Failure to adopt as perfect aseptic technique as the circumstances of the case enable him to carry out.

(2) Acquiescence in the patient's confinement in

maternity homes where asepsis is impossible or neglected, when such a course can be avoided.

(3) Allowing women to go to unregistered homes.

(4) Accepting as the maternity nurse, a woman whom they knew to be unreliable, owing either to insufficient education or to her personal character.

(5) Unnecessarily interfering with the normal course of a normal labour.

(6) Resistance to all efforts to raise the standard of either a practitioner's or a nurse's knowledge and work, in other words, the adoption of a spirit of *laissez faire* towards an acknowledged evil.

I will give two instances to show what I mean. A practitioner—with obstetrical leanings and every opportunity of acquiring obstetrical experience—in a New Zealand town complained to me that the Inspector of Hospitals was too severe. When I asked what he meant, he said the inspector had questioned the accuracy of charts in a private hospital, because he had found a consecutive set of some fourteen in which the temperatures ran a level line of 97.4° F. or thereabout. He added that the inspector should not question a matron's *bona fides* unless he had positive proof to the contrary. He did not suggest how such proof was to be obtained. A week later I met a practitioner in another town, who began to discuss a new maternity hospital, saying that at any rate it was certain it would be managed honestly. I asked him what he meant. "You know as well as I do," he said, "that every chart in every maternity home in this town is faked."

The first practitioner knew too that chart-faking

was rampant in his district, and, if an outbreak of sepsis had occurred in the hospital under suspicion, his attitude of "*laissez faire*" would have made him partially responsible.

The second instance relates to a nurse—a most conscientious and capable woman. She was engaged to attend a patient with an official of the Health Department. The latter had arranged that to avoid mistakes she should receive the instruction in aseptic technique and the list of patients' requisites prescribed by the Department. Some weeks later he asked if the patient had got the necessary things. "Oh yes," said the nurse, "I gave her my own list," which said list omitted almost everyone of the things which were prescribed as necessary for the aseptic conduct of labour. In other words, the nurse had both failed to recognise the necessity for an aseptic technique, and was unable to realise that she was asking the medical practitioner to stultify himself by omitting essentials which he had himself laid down as necessary. The patient was a wealthy and sensible woman, who would have been only too anxious to get everything she was told was necessary. If this nurse—who, as I say, was a most conscientious woman—was prepared to act as she had done in this case, what hope was there of other maternity nurses acting differently?

If sepsis had occurred, the public would rightly have blamed both nurse and practitioner—the former for failing to carry out her instructions, and the latter for allowing her to fail.

Resistance to reform is not always passive.

Professor Beckwith Whitehouse (*Brit. Med. Journ.*, February 4th, 1928 ; *Supplement*, p. 34) relates the following incidents that all happened within a month in " a high-class maternity nursing home." Refusal to have the obstetrical forceps boiled, refusal to wear a sterilised gown during labour, the placing of sterilised instruments on an unsterilised area, and the use of silkworm gut direct from a box without any sterilisation.

I think that most medical men will agree with me when I say that anyone, who knowingly and unnecessarily does these things, should be tried for manslaughter if his patient dies of sepsis.

On the other hand, when what I may call " the uncontrollable forces of nature " (to wit, the economic situation, the resistance of a patient or her friends, and the natural desire to make the best of a bad job) compel a practitioner to agree to a patient going into what he knows is an unsuitable home, it is unfair to blame him for the consequences. Similarly, it is unfair to blame a matron who has been allowed to institute a hospital, which it is obviously impossible to work both safely and with a due regard to economics, provided she has done the best that circumstances permit her to do. Her innocence, however, does not make it any less necessary to close down her hospital if sepsis occurs, or even to prohibit its continuance.

There is a story of O. Henry's in which an unfortunate girl, who has killed her lover, kills herself and gets to the other world. The plain-clothes man who hustles the spirits round shakes his head and

says it is waste of time bringing her to judgment. Her future residence is obviously below. However, she is taken, by a court official, to the judge. In a moment the official returns without the girl. "You quit making false arrests, or you'll be transferred," he says to the plain-clothes man. "The guilty party you've got to look for in this case is a red-haired, unshaved, untidy man, sitting by the window reading, in his stocking feet, while his children play in the streets."

The moral is obvious. If you want to find out why a conscientious and well-educated midwife is the matron of a home in which septic outbreaks occur, go and look first for the official who allowed her to waste her money in starting it under unsuitable conditions. You will find he, too, is the wrong person, so go further and look for the economic causes whose victim he is. Do not blame the nurse, who is also their victim, provided she has done her best honestly and with judgment in the unfortunate position into which it has pleased society to call her.

I pass on now to the details of the aseptic technique of labour. The following scheme has been drawn up by the Inspector of Hospitals in New Zealand for the conduct of labour in private practice and in small maternity hospitals :—

"Introduction.—To conduct labour aseptically with the simple appliances which are described below, and without assistance, each step of the preparation must be taken in the correct order,

otherwise the hands will have to be sterilised many more times than is necessary.

“ The scheme assumes that dry steam-sterilised outfits are at hand. Such outfits should be prepared early and sterilised in the eighth month of pregnancy, and be ready in the patient’s home or private hospital at the time of labour. Arrangements for their sterilisation can be made through the ante-natal clinics, or they will be sterilised at a small cost at any public hospital, general or maternity. Failing such arrangements they can be packed in the proper order in a linen or cotton bag and sterilised by boiling ; then hung out in the bag to dry ; and finally placed, still unopened, in a tin container or wrapped in strong brown paper and baked in a slow oven until drying is completed. They must be kept in a safe place, still closed up, until wanted. When from neglect or accident a dry sterilised outfit is not provided, and there is no time to get or to prepare one, an additional number of napkins and swabs, sterilised by boiling, and three vulvar pads, must be added to the boiled outfit, as will be described later. Under these circumstances a freshly washed skirt and draw-sheet will have to be used instead of the sterilised one, and the vulvar pads for use during the puerperium must be sterilised by boiling and baking as above.

“ A nurse should always take to a midwifery case two or three washing overalls that fasten at the back and have belted waists and short sleeves. Whenever possible one of these should be sterilised within a wrapper and used during the actual delivery and

should be put on immediately before putting on the sterilised gloves. If a sterilised overall is not available she should pin on a sterilised guard as an apron, covering as far as possible the front of the unsterilised overall.

“ The Appliances and Dressings required for Labour and the Puerperium :—

“ APPLIANCES :—

“ One two-gallon jug for sterilised water. Two 14 inch bowls. Two 12 inch bowls. One large saucepan, or a third 12 inch bowl. Two 5 inch bowls. (The foregoing should be of enamelled iron, and are best of the deep or “ mixing-bowl ” shape.) Rubber gloves and guarded finger-stalls. Two nail-brushes. One Turkish towel washing-glove. One pair scissors. One metal female catheter. One pair dressing-forceps. Twelve binder-pins. Tablets of biniodide of mercury, 8·75 grains. Soap : Any good soap which has been boiled in the making and contains a mild antiseptic. Methylated spirit, one pint. Tincture of iodine, two ounces.

“ DRESSINGS :—

“ (1) *The Labour Outfit.*—This consists of two parts, one of which is dry sterilised and the other of which is boiled.

“ (a) *Dry Outfit.*—To be packed in a suitable container before sterilising, such as a sterilising-drum, tin box or canister, or linen or cotton bag, which is then placed for protection in a bag of brown paper. The outfit to be packed in the following order, from above downwards :—

“ One table-cover. One napkin or towel. Twelve

swabs of tow or wool wrapped in muslin, gamgee tissue, or similar material in a calico wrapping. One draw-sheet. One apron-skirt. One pair white cotton stockings or leg-guards. Three vulvar pads, each ready folded in a diaper, so that when opened up the whole can be applied without touching the pad or the inner side of the diaper. This is done by folding the diaper twice lengthways, laying the pad upon it at an equal distance from each end, folding the ends over so that each covers half the pad, and then again folding pad and diaper in the middle. Five napkins for leg-guards. One extra draw-sheet. One binder. Six umbilical dressings.

“(b) *Wet Outfit*.—Four baby’s napkins for guards. Twelve large swabs. Umbilical ligatures of soft knitting-cotton.

“(2) *The Lying-in Outfit*.

“(a) *Dry Sterilised Outfit*.—Thirty-six vulvar pads. Thirty-six wool or tow swabs.

“(b) *Unsterilised Outfit*.—Four binders.

“In a hospital equipped with proper sterilisers the utensils are sterilised in a suitable boiler or steam steriliser and the jug is used for cold sterile water. The dry outfits are sterilised each in their own container in a high-pressure steam steriliser. The wet outfit is to be boiled, with the nail-brush, scissors, and forceps, in any boiler for thirty minutes.

“When a basin and water steriliser is not available the utensils and water are sterilised as follows : The two-gallon enamel jug, filled with boiling water and covered with a cover-cloth, which is pinned to the handle, is placed on the stove and boiled for thirty

minutes, by which means jug, water, and cover-cloth are sterilised together. It is then left to cool.

“ The six basins, together with the wet outfit—(1) (b), two nail-brushes, scissors, forceps, and ligatures—are sterilised as follows: One 14 inch enamel bowl with about a quart of water is placed on a stove or gas ring, and in this is placed one 12 inch bowl, called the “dressing-bowl,” half filled with 1 in 2,000 biniodide solution. In this are placed the four napkins, and upon them the two smallest bowls, one containing nail-brush, scissors, and ligatures, for the umbilical cord; the other the twelve swabs, forceps, nail-brush, and washing-glove. The remaining 12 inch enamel bowl is placed upside down as a lid over its fellow, and the remaining 14 inch bowl then covers this and forms a lid to its fellow 14 inch bowl, which is used as the boiler. These bowls are now boiled and steamed for one hour.

“ Lastly, the gloves and finger-stalls are put on to boil for ten minutes in the saucepan or the third 12 inch bowl.

“ *The Labour Bed.*—This is made as follows:—

“ (1) The mattress.

“ (2) A large waterproof sheet covering the mattress and turned in beneath it.

“ (3) An under blanket.

“ (4) The under sheet.

“ (5) A draw-sheet.

“ (6) A waterproof sheet, 1 yard by $1\frac{1}{2}$ yards, covered by a draw-sheet.

“ (7) A pillow.

“(8) A top sheet and the necessary number of blankets.

“(9) A cover-sheet.

“The upper draw-sheet and waterproof should hang down over the right-hand side of the bed as a valance. The top sheet is folded over the right-hand side and top of the blankets and cover-sheet, and pinned in place. The left-hand side and bottom of the upper sheet and blankets are tucked under the mattress. These can be untucked and pinned up at the end of the second stage or during the time the nurse is working on the left-hand side of the bed.

“*The Preparation of the Patient.*—While the appliances are being sterilised the preliminary preparation of the patient is carried out as follows :—

“(1) The temperature and pulse are taken, and recorded on the patient’s chart.

“(2) The hair on the vulva is clipped close or shaved.

“(3) An enema is given, and the bowels and bladder are completely emptied.

“(4) The patient is given a warm bath (unless labour is too far advanced), and is then dressed in a clean vest, nightgown, dressing-gown, stockings, and slippers, and taken to the waiting ward or the labour ward for examination, where abdominal palpation and auscultation of the foetal heart are carried out. The nightgown is folded up under the arms and the singlet pinned over it with four safety-pins ; the patient is then placed in the left lateral position and covered with the sheet and blankets ; the dressing-gown is removed or drawn up above the waist. The

skin round the anus is then carefully washed with soap and water, and swabbed over with biniodide solution (1 in 2,000).

“ Sterilisation of utensils and wet dressings having been finished, the labour outfit is now opened. The sterilised table-cover is taken out, care being taken not to touch the inside of the container or the other contents, and is spread upon a table, the side which has been touched by the hands being next the table, the untouched side uppermost. The bowls are now placed upon it. The 14 inch cover-bowl is removed and placed upright upon the table ; then the 12 inch cover-bowl and the two 15 inch bowls are lifted from the dressing-bowl and placed upright upon the table, and the dressing-bowl is removed from the boiler-bowl. The gloves and finger-stalls are now poured into the 14 inch cover-bowl.

“ Two 8·75 tablets of biniodide of mercury are placed in one 12 inch bowl, and four ounces of hot water are added, to which is added one pint of methylated spirit to make a solution of 1 in 500. One 8·75 tablet of the same antiseptic and two pints of sterilised water are placed in the second 14 inch bowl, to make a solution of 1 in 2,000. The nurse must remember that while the insides of the different bowls are sterile, the outsides are not.

“ The nurse now washes her hands and forearms with soap and hot water in a basin which has been previously sterilised, or scrubbed, and scalded—running water is preferable, but only available in hospitals. After changing the water she scrubs her hands and forearms for five minutes with soap and

hot water, using a sterilised nail-brush. After rinsing off she plunges them into the biniodide and spirit lotion, and, taking out one of the boiled swabs, squeezes it out into the slop bucket, and scrubs her hands and forearms for three minutes with it in the 1 in 500 spirit lotion, paying special attention to the nails, roots of the nails, and in between the fingers. Lastly, she rinses the spirit lotion off in the bowl of 1 in 2,000 biniodide lotion.

“ With sterilised hands the nurse now proceeds to complete the preparation of the patient, who has already been placed in the left lateral position on the bed. Having placed a swab wet with the weak (1 in 2,000) biniodide lotion between the labia, she vigorously washes the skin round the vulva, thighs, and gluteal regions, again using the weak lotion and soap, with the boiled washing-glove, or one of the boiled guards from the dressing-bowl used as a washing-cloth, and keeping the anus covered with a sterilised swab.

“ The patient is now placed in the dorsal position, and the swab from between the labia is removed. Then, with swabs soaked in 1 in 2,000 lotion, the vulva is washed by a stroke of the swab from before downwards and then backwards, using three swabs in succession, and finally squeezing lotion from a swab over the vulva. Lastly, a fresh swab, squeezed out of the 1 in 2,000 biniodide lotion, is placed between the labia, where it remains.

“ The patient is then placed in the left lateral position, and the nurse dries the skin round the vulva with a dry sterilised swab, and paints the

thighs, buttocks, and perineum for a distance of from five to six inches from the vulva region with tincture of iodine, poured direct from the bottle on to a dry sterilised swab. The vulva is now covered with one of the dry vulva-pads and diapers, unless a vaginal examination is necessary. If so, it should be made now. For this purpose the nurse, having first washed her hands again in the biniodide and spirit, rinses them off in the 1 in 2,000 lotion, and puts a guarded finger-stall or glove on the examining fingers. A sterilised guard from the dressing-bowl is arranged over the inner side of the left thigh, the outer edge covering the buttock, and, with the left hand raising the right buttock and drawing the upper and outer corner of the thigh-guard so that it covers the perineum and anus, the examination is made. The guard protects the hand from contact with the skin, except where it comes in contact with the labia.

“ *The Conduct of the Labour.*—If the patient is in the first stage of labour she may then be allowed to walk about, the sterilised vulvar pad and diaper being first fixed in place. If the patient is in the second stage of labour she stands up for a moment while the damp draw-sheet or towel that covered the mackintosh sheet is removed from the bed and replaced by a sterilised draw-sheet. She is then placed thereon, the apron skirt having first been tied on while she was in a standing posture. Before lying down the stockings and dressing-gown are removed and the white cotton stockings are drawn on. A fresh

sterilised guard, dry or wet, is used for each examination that is necessary, and after the examination the vulva is covered with the sterilised pad and diaper. During the birth of the child the same precautions are taken as for making a vaginal examination, except that a second guard is placed over the right thigh and buttock, and a pad soaked in 1 in 2,000 biniodide is held in position against the anus and under the perineal guard, and gloves are worn by the nurse. After the birth of the placenta the vulva is washed down with swabs soaked in weak biniodide solution. A sterilised swab wet with biniodide solution is lightly placed over the labia, and a sterilised vulvar pad and diaper applied.

“ Though originally sterilised before use, the tablecloth, skirt, draw-sheet, and stockings must not be regarded as sterile after they have been in use.

“ *The Management of the Puerperium.*—There are three essentials in the aseptic management of the puerperium, and they are—

“ (1) To prevent the entrance of bacteria into the vagina.

“ (2) To keep the vulva and the perineum as dry as possible.

“ (3) To promote drainage from the uterus and the vagina.

“ The entrance of bacteria is prevented, firstly, by avoiding any form of vaginal interference, such as douching, examinations, or the passage of swabs into the vagina when cleansing the vulva ; secondly, by maintaining as far as possible the vulva and perineum in a condition of surgical cleanliness ; and, thirdly,

by using such vulvar dressings as are either sterile or antiseptic.

“ The vulva and perineum are kept dry, firstly, by using dry sterilised dressings, or, when that is not possible, by using dressings which have been soaked in an antiseptic and then wrung out dry ; secondly, by removing as frequently as is necessary all dressings which have been wet by lochial discharge ; and, thirdly, by preventing the contamination of the vulvar skin by urine or fæces.

“ For a varying time after labour is over the lochial discharge may be heavy, and in some cases will soak through the outer dressings. When this occurs the pad must be changed and a new one put on, and this may have to be done every two to four hours. Later, as the discharge lessens, the pad need not be changed oftener than every six to eight hours. Each pad must be burnt immediately after removal.

“ The drainage of the uterus and the vagina is promoted, firstly, by allowing the patient to sit up and move about freely in bed as soon after labour as her condition justifies, and it is usually possible to do so the day after delivery unless the perineum has been torn ; secondly, by making her sit on a chamber when passing urine and when the bowels act, instead of lying on a bedpan ; and, thirdly, by getting her out of bed as soon after labour as her condition allows, and this can usually be done about the second or third day.

“ A patient who has had a normal labour should use a chamber instead of a bedpan right through the

puerperium, either in the sitting or in the kneeling position. When a patient is sitting up during the emptying of either the bladder or rectum, and is at the same time making slight straining efforts, she causes a distinct pressure on the uterus, and this tends both to squeeze its walls together and to press it down into the vagina. In this manner the lochia is pressed out of the uterus into the vagina and out of the vagina into the chamber. If the patient is sitting up during this process, the escape of the lochia is faster and more thorough, because it is running downhill, instead of tending to collect in the upper part of the vagina. When a patient lies down the upper part of the vagina is the lowest part of the genital tract, and all discharge tends to collect there ; if she does not sit up or turn over at regular intervals this discharge never gets completely away, and tends to undergo decomposition. Consequently, the regular sitting-up of the patient during the whole course of the puerperium is one of the most important points in the prevention of sapræmia.

“ For the same reason, as soon as a patient gets over the exhaustion of labour the nurse ought to encourage her to sit up in bed as long as she can do so without fatigue.

“ The date at which a patient leaves her bed is usually a matter for the medical attendant to decide. The earlier she is well enough to do so the better for her, as such movements promote drainage, and help the action of her digestive system, so that her appetite increases and her bowels work more regularly. Many women are better for being let up for a short

time from the second day on ; but if a patient is weak, or has had a difficult labour, or in any way such as this departs from the ordinary standard of the lying-in woman, she must be kept in bed for a considerably longer period.

“ Recognition of, and attention to, the foregoing points are the foundations of the aseptic technique of the puerperium.

“ The appliances required when changing the vulvar pads and cleansing the vulva region and the perineum are as follows :—

“ STERILISED APPLIANCES :

“ One 14 inch bowl. One 12 inch bowl. Two 5 inch bowls. One nail-brush. One pair of forceps. One teaspoon. One jug of sterilised water.

“ UNSTERILISED APPLIANCES :—

“ One bedpan. One chamber.

“ STERILISED DRESSINGS :—

“ One vulvar pad. Two swabs (from the dry sterilised outfit). Six tow, rag, or cotton-wool swabs, to be sterilised by boiling for twenty minutes.

“ UNSTERILISED DRESSINGS :—

“ One diaper, about 27 inches square, folded in one direction so as to make six thicknesses. One binder. One draw-sheet.

“ The appliances are sterilised as follows : The 14 inch bowl containing a quart of water is placed upon the gas ring or stove to boil, and in it are put the nail-brush, the two 5 inch bowls, one inside the other, in the upper of which is placed the forceps, teaspoon, and the six swabs in a little boiling water. The 12 inch bowl is placed upside down upon the

14 inch bowl as a lid. These are boiled for twenty minutes.

“While the appliances are being sterilised the patient is prepared as follows: The binder, the soiled vulvar pad, and the napkin are first removed, and the patient sits upon the chamber and empties the bladder, and the bowels if necessary. She is now placed upon the bedpan, with her shoulders well raised so that they are above the level of her hips. The bedclothes are folded downwards, and a folded blanket is placed across the chest and abdomen so to cover the otherwise uncovered portion of the patient.

“The nurse now washes her hands and arranges the appliances as follows: A table is placed on the right-hand side of the bed near the foot, and covered with a clean towel. The basins and the appliances that have been sterilised, and the container with the sterilised vulvar pads and swabs as described already, a jug of warm sterile water, a bottle of biniodide tabloids or a bottle of Izal for making the washing-lotion, are placed on the table. The cover-bowl is removed and placed upright on the table. The two 5 inch bowls are removed from the 14 inch bowl, taking care only to touch the outsides of them, and are also placed on the table. The antiseptic lotion for swabbing is prepared as follows: A quart of warm sterilised water is placed in the 12 inch bowl, to which is added one 4·37 grain tablet of biniodide of mercury, or one teaspoon of Izal. Some of this is poured into the 5 inch bowl of swabs. The nurse now scrubs her hands for five minutes with soap and

hot water in the 14 inch bowl, using the sterilised nail-brush, and soaks her hands for three minutes in the 12 inch bowl of lotion. With the forceps she removes from the container one vulvar pad and two dry swabs, and places them in the dry 5 inch bowl, the swabs on the top. The patient now raises the upper blanket, and the nurse with her right elbow pushes the folded bedclothes downwards. With a wet swab held in the forceps, the finger and thumb of the left hand separating the labia, she swabs the vulva from before backwards, using three swabs in succession. She then places a wet swab just within the labia, and with the remaining wet swabs she thoroughly cleans the surrounding skin, and then pours the antiseptic lotion left in the 5 inch bowl over the vulva. The vulva and surrounding region are well dried with one of the dry sterilised swabs. The swab is removed from between the labia, the bedpan is removed, the patient is placed in the left lateral position and her back is dried with the remaining swab. The patient is now turned again over into the dorsal position, the folded diaper is placed on the bed with one end under the lower part of the back. The sterilised vulva-pad is then removed from the basin, the nurse's fingers touching only the outside of it; it is then applied to the vulva, and the diaper is brought forward over the pubes to hold it in place. The binder is next placed under the patient and pinned in place so as to secure both ends of the diaper. The binder must reach a full hand's-breath below the trochanters."

I have often heard the preceding scheme criticised

by medical practitioners on the grounds that it was complicated, expensive and unnecessary, but I have never been able to induce any of its critics to explain how it could be simplified. It is extraordinarily difficult to draw up a scheme which can be worked satisfactorily by a single nurse, and which will not break down when put into practice. I confess I should attach more weight to its critics if I could convince myself that they habitually tried to carry out asepsis during labour, and that their precautions approached those habitually adopted for even a simple curetting.

The provision of sterilised dressings for use during labour is undoubtedly a difficult matter. It is also an essential of any aseptic technique. Even in maternity hospitals which possess a steam steriliser the necessary dressings are frequently not forthcoming. It does not seem to be anyone's duty to provide them. The patient through ignorance, real or assumed, says she knows nothing about them. The maternity hospital does not include their provision in the weekly fee charged. The medical practitioner, while he can insist, cannot himself provide. As a matter of fact the number of practitioners who recognise the necessity for such dressings is very small.

The inevitable result is that it is almost invariably possible for septic towels, pads, and dressings of all kinds to be used throughout a labour. To any who compares the relative risks and aseptic ritual of a labour and of a minor surgical operation, this seems to be a very serious state of affairs.

I am of opinion that, at the present time, the only satisfactory solution of the question is the provision of the necessary aseptic dressings and materials in packet form for the use of the poor by the local health authorities, and by the sale of similar, or more elaborate, packets in chemists' shops for the use of the well-to-do. This will remove the excuse that dressings are not available. Their use should then be made compulsory, such compulsion being first applied by medical opinion. If such opinion fails in the task, then I think Public Health Authorities should be given powers to compel the use of sterilised dressings at confinements. I am inclined to think that it would be in the power of the Central Midwives Board, or equivalent bodies in other countries, to compel the midwives on its roll to obey such a regulation. If some such step as this was taken, it would help to end the ludicrous situation in which a medical practitioner finds himself when in the morning he removes tonsils with the strictest aseptic ritual, and in the evening he removes a placenta with none.

THE AVOIDANCE OF INTERFERENCE

The avoidance of interference during labour is the second detail in the general management of labour which helps to reduce maternal mortality. Such interference usually takes one of four forms : unnecessary vaginal examinations ; unnecessary forceps applications ; improper management of the third stage ; operations other than forceps applica-

tion the result of lack of ante-natal and first stage diagnosis.

Unnecessary Vaginal Examinations.—By unnecessary vaginal examinations I mean those that are in excess of the necessities of the case. Personally I have always considered and taught that, in the ordinary case, one examination was necessary at the beginning of labour to exclude complications that could not be recognised by abdominal palpation and rectal examination, and one, in multiparæ, when the membranes ruptured to exclude prolapse of the cord, and secondary malpresentations of the head. This view perhaps should be modified, in that competent ante-natal care can make the former examination unnecessary. It is also very probable that skill and practice in rectal examination will remove the necessity for the second vaginal examination. If this is so, then routine vaginal examination in ordinary cases can be wholly avoided. When, however, an abnormality is present, then it is probable that vaginal examination is essential.

Unnecessary Application of the Forceps.—This is the most abused operation in midwifery, and it would probably not be an exaggeration to say that in general practice the rate of forceps application is from three to five times greater than it need be. I am postponing the fuller consideration of the matter until a later chapter (*v.* Chapter V.). Here, it is enough to say that the abuse of the forceps either by its premature application, or by its too frequent use, is responsible for maternal injuries, hæmorrhages, sepsis, and sometimes even death, and also for

foetal injuries and death. Therefore in the interest of both mother and child it is necessary that such abuse should be strictly forbidden.

The necessity for forceps application can be largely avoided by the proper management of the first and second stages of labour, by the use of sedatives when necessary and of obstetrical anæsthesia in the second stage, and by the injection of pituitrin when delay is due to weak uterine contractions and when no contra-indication to its use exists. I refer to these matters again when discussing the abuse of the forceps.

Improper Management of the Third Stage of Labour.

—Premature efforts at placental expression and traction on the cord favour both primary and secondary post-partum hæmorrhage, and its necessary intra-genital treatment. The manual removal of the placenta is probably more prone to cause severe septic infection than is any other operative procedure. Consequently, if maternal mortality from sepsis and from hæmorrhage is to be reduced to the minimum, the correct management of the third stage is essential.

Operations the result of lack of Ante-natal Care or of First Stage Diagnosis. — Under this heading may be placed all such operations as high forceps, “failed forceps,” unexpected Cæsarean section done late in labour, and craniotomy and other destructive operations on the fœtus. They are all to be found amongst the worst causes of maternal mortality, because they are almost all avoidable. I propose,

however, to leave their consideration to a later chapter (*v.* Chapter VIII.). Here, it is enough to say that the intelligent anticipation and prevention of complications, and their early treatment when prevention is impossible, is one of the effective means of reducing maternal mortality.

GENERAL MANAGEMENT OF LABOUR

I have written in another book as follows : “ The whole management of labour may be summed up in a few words—to maintain the patient’s strength, to relieve pain and lessen nerve strain, to help the natural efforts in a natural way, and to avoid meddling and dangerous interference. The more we depart from these principles the greater are the morbidity and mortality amongst our patients.”

It is unnecessary to discuss here at any length how these principles should be carried into practice. Even those who do not always obey them, recognise their wisdom. Moreover, I shall refer to them again in the two following chapters.

It is obvious that a woman, who has been allowed to come into labour in a condition of poor muscular development and under-nourished, and whose strength is allowed to fail during labour for want of proper nourishment, cannot provide successfully the muscular effort that is wanted during labour. Similarly, the woman, who is worn out by pain and sleeplessness and in constant terror of what is happening and is going to happen, cannot successfully help herself—hence the necessity for sedatives and anæsthesia as the occasion arises.

The administration of sedatives during labour by midwives has recently been the subject of discussion. Many people—such as Fairbairn—who are thoroughly competent to express an opinion, consider that the commonest causes of weakening of uterine powers are fatigue and the emotional disturbance from anxiety and recurrent pains ; that to remove the cause of a trouble is the first principle of preventive medicine ; that a dose of laudanum will often secure a natural end of labour ; and that there is no valid reason why it should not be given by a midwife. Others hold the view that a sedative is only required in an abnormal labour, and the care of an abnormal labour is not the province of a midwife.

Personally, I agree with Fairbairn, and I would be prepared to sanction the administration of sedatives by midwives who had been properly trained, provided the patient had had a recent and complete ante-natal examination by a medical practitioner. I do not think for a moment that a labour becomes abnormal because a sedative is required. It is far truer to say that it may frequently become abnormal because one is refused.

Further, I can see no reason why a midwife should not give the necessary amount of anæsthetic to produce obstetrical anæsthesia, provided she has been taught how to do so, and provided she is compelled to use an apparatus that is free from the risk of spilling the chloroform. Murphy's inhaler, and the small dose of chloroform it can give, are less dangerous in a midwife's hands than are gas and

oxygen in considerable dosage in the hands of a dentist.

It is unnecessary to speak of the benefit of obstetrical anæsthesia, as it is generally recognised. Attempts to prevent midwives from making use either of it, or of sedatives, are really dictated by the wish to discourage their attendance on normal cases, and are not, in my opinion, based on reasonable objections.

In New Zealand, both maternity nurses and midwives are taught to induce obstetrical anæsthesia with a Murphy's inhaler, and the administration of chloroform by the nursing staff of the public maternity hospitals is sanctioned. This decision was arrived at some four years ago, and so far there has been no reason to regret it. Its beneficial effect on the patients is obvious.

On the other hand, I am not prepared to recommend that a midwife should be allowed to give pituitrin, although its administration under suitable conditions would often save medical intervention and consequent forceps application. Pituitrin given under wrong conditions, that is, when there is some positive obstacle to the descent of the head, is too dangerous a drug to be placed in non-medical hands.

The natural efforts of the patient are helped in a natural way by removing all small obstacles to the descent of the child, such as uterine obliquity, full bladder, loaded rectum ; by so placing the patient that she can use her voluntary efforts to the best advantage ; and, so far as possible, by avoiding or removing the various mechanical complications of

labour. In a later chapter I propose to discuss how far we have wandered from nature in this respect (*v.* Chapter IX.).

Unnecessary interference has been already discussed.

There is another principle which I should like to add to those given above, namely, that the patient should be left in as normal a condition as is possible at the end of labour. In great part this is carried into effect by following the principles already suggested. There is, however, at least one further practice that is also necessary, namely, the careful closure so far as possible of any lacerations of the perinæum or lower vagina.

I have already referred to the inside of the uterus as being one large wound open to the reception of septic bacteria. It is, however, under normal conditions protected from the entrance of the latter. Perinæal wounds, on the other hand, have no such protection, and are very prone to receive any infections which may come into their neighbourhood. Such infection may simply result in local trouble—the so-called puerperal ulcer, or it may lead to a general infection of a varying degree of severity. The obvious indication is therefore to close all wounds of the perinæum and lower vagina by suture, not only because of their effect on the future strength of the perinæal floor, but because of the immediate danger they cause.

Cervical wounds are another matter. They, like the uterine cavity, are further from infection. Moreover, the operation is more difficult, and more liable

to entail the carrying of infection into the region of the uterus. The suture of such wounds, when necessary, is better done at a later date.

There are still other matters which may properly be considered under the head of "General Principles." There is, *inter alia*, firstly, the manner in which a room in a private house should be arranged for labour, and, secondly, the instruments or appliances which a medical practitioner must carry with him for use in a private house. The importance of each of these is very often overlooked, with the result that, when some complication such as hæmorrhage occurs, the arrangement of the room and the lack of appliances militate seriously against prompt and effective treatment.

The first point about the room is to try to bring it as nearly as possible into a condition which makes relative asepsis possible. A few days prior to labour it should be "turned out" in the literal meaning of the words. Carpets must be removed and shaken, and, if possible, not replaced. There is no virtue in domestic dust that renders it sterile! The floor must be scrubbed, and all hangings removed and cleaned, or, preferably, washed. The walls and ceilings should also be swept down. All unnecessary furniture should be temporarily removed.

When labour begins, the first step in the arrangement of the room is to place the bed in a position in which the strongest light available will fall on its right side. If the labour is going on through the day, this light will come from a window; if at night,

from an electric lamp or other source of light. Light is essential. It is impossible to carry out satisfactorily any operative treatment that is necessary if it is not available. The suture of perinæal tears especially calls for it.

If the labour begins at night and continues into day, or *vice versâ*, the position of the bed must be changed to suit the changing light.

There must be at least two empty tables in the room, and preferably three. The washing basin and antiseptic lotions are placed on one. The domestic washstand is seldom suitable. The second table is kept for sterilised instruments and aseptic outfit. The third table is for the unsterilised part of the equipment.

There must be at least two chairs, one of which must be of a suitable height for the practitioner when he is doing any such operation as forceps application. The very general practice of standing, during this and many other obstetrical operations, is not an advantageous procedure.

There must be a bath to go under the bed into which the mackintosh beneath the patient hangs. All these things are elementary, but—they are often absent. Where emergency compels their absence, it may be unavoidable. A main object of modern midwifery practice, however, is to avoid emergencies by ante-natal care and instruction. Therefore, the absence of the essential should be only the occasional exception that proves the rule.

The armamentarium of the obstetrician will be found in any work on midwifery. It is unnecessary

to discuss it here. I will, however, suggest the apparatus that should always be sterilised and in the room, ready for the emergency which we earnestly hope may not come. Many an avoidable tragedy has resulted from want of preparedness. The apparatus I suggest is as follows: Needle-holder, needles, catgut, and silk-worm gut. A strong pair of blunt-pointed scissors curved on the flat. A large posterior speculum. A metal catheter. Neither glass nor rubber is permissible. Two volsella, such as the well-known "American bullet forceps." A *large-sized* Bozemann's douche catheter. A sharp-pointed cannula for saline infusion, or else the necessary apparatus for intravenous saline. A tin or jar of sterile iodoform gauze for uterine or vaginal plugging. This gauze must before packing have been cut in the length in a size suitable for its purpose.

I repeat what I have already said. This apparatus must be prepared and sterilised some time before delivery, in order that it may be available the moment it is required. When a woman is bleeding profusely after labour, it is not the time to grope for appliances in a midwifery bag in the corner of a dark room. Both doctor's and nurse's hands are wanted for more essential purposes.

Finally, both hot and cold sterile water must be available in sufficient quantities without the nurse having to leave the room to get it.

I can quite imagine the plaintive exclamation of a practitioner when he reads the foregoing: "You told me labour was a normal function," he cries, "and now you are telling me to prepare for it as if it

was a death struggle." True, oh friend. I told you that labour would be a normal process in from eighty to ninety per cent. of women if it was given the chance. I also told you, however, that five per cent. of women would probably die if they did not receive medical help. It is mainly for the sake of these five per cent. that you are in attendance, and it is your duty to be ready for the immediate treatment of the emergency that may occur.

THE PUERPERIUM

I have already discussed the general management of the puerperium from the point of view of aseptic technique. There remain, however, certain other matters.

The first of these is the necessity for recording with great care and regularity the range of the patient's temperature and pulse rate, in order that variations from the normal may be at once recorded. This apparently obvious responsibility is often overlooked, and sometimes even deliberately evaded. I have discussed such evasions elsewhere.

Another most important factor in the management of the puerperium is early and free movement of the patient in bed, and early getting out of bed. Such practices not alone favour her general well-being, but also help her to fight against a possible infection by promoting freer drainage from the vagina. They also help materially to lower the occurrence of that most fatal complication pulmonary embolus. A small but important detail in the promotion of movement and drainage is the habitual use of the

“chamber” instead of the bed-pan when the bladder or rectum is emptied, as the former necessitates the sitting position.

When I was at the Rotunda Hospital I adopted a general rule that normal patients should leave their beds once or twice daily during the second and third days after their confinement. From the third day onwards, they were allowed to sit in a chair for a few minutes, the time they remained up being gradually increased so long as the patient's condition continued to be satisfactory. I have always considered that the health of the patients benefited therefrom.

Professor Walthard's remarks on the effect of early exercise on the frequency of pulmonary embolus deserve special notice. They may be summed up as follows :—

(1) The cause of embolism is the formation of thrombi in the veins, and one of the essential factors in the production of the latter is the slowing of the circulation.

(2) In the horizontal position such slowing is most marked in the femoral and hypogastric veins. Consequently, thrombosis occurs most frequently in them.

(3) The rate of the blood-stream during the puerperium can be accelerated by exercises while lying in bed, and so the formation of thrombi can be prevented.

(4) After the introduction of such exercises in the University Frauenklinik of Zurich amongst 20,000 puerperal women there was only one death from embolism.

The exercises which Professor Walthard recommends are as follows :—

(1) Sitting, the arms are stretched upwards and sideways. Each movement is done five times in each direction.

(2) Lying flat in bed with a pillow under the head, and with the outstretched hands gripping the bars of the top of the bed, the left leg is raised, flexed, stretched, and brought down again, then the right, then both limbs together. Each movement is done five times.

(3) Lying on the back with arms by the sides, a deep inspiration and expiration are taken five times.

(4) Lying on the back with hands on the waist, the body is raised to a sitting position and then lowered. Each movement is done from three to five times.

(5) Lying on the back with hands stretched over the head, gripping the top bars of the bed, the outstretched lower limbs are circumducted first inwards, then outwards, care being taken to keep the limb extended at the knee. Each movement is done five times.

(6) Lying on the back with the hands on the waist, the knee joint and hip joint strongly flexed, and the feet resting on the bed, the pelvis is slowly raised into the “bridge position.” While in that position the knees are spread out and closed three times.

(7) Sitting, the arms are lifted upwards during deep inspiration and then brought down again in expiration. This is done five times.

These exercises are begun gradually, and are increased in number and in variety each day.

While the tendency in New Zealand is to allow greater freedom of movement than was customary in the past, I do not think that anything like the early rising at the Rotunda Hospital or the free movements of Professor Walthard is encouraged. In the three years 1925-26-27, amongst 85,385 births, twenty-nine cases of death from pulmonary embolus occurred in New Zealand. This is at the rate of 6.7 per 20,000 births, or more than six and a half times the rate quoted by Professor Walthard.

The final act in the management of the puerperium, so far as the medical attendant is concerned, consists in the careful pelvic examination of the patient, with a view to determining the presence or absence of any lesion or other consequence of the labour.

The most frequent complication to find is a backward displacement, and next to that an unhealed perinæal or cervical tear. More rarely some evidence of pelvic cellulitis may be found, or even of tubal infection, but in such cases there is usually a history of pyrexia and other symptoms of a local sepsis.

A backward displacement must be corrected and kept in place with a suitable Hodge or Smith-Hodge pessary, but before a diagnosis is made the bladder must be empty. A very common mistake is to regard the temporary backward position of the uterus due to a full bladder as a permanent displacement. Similarly, before any effort is made to replace the uterus the bladder must be empty. Otherwise efforts at replacement will merely cause pain and be non-effective. The patient must return

for examination the following day to see if the pessary is correcting the displacement. A pessary, that does not keep the uterus in place, does active harm because the uterine body tends to get caught and compressed behind it. If the displacement has recurred, a different size of pessary must be tried.

If all is well, the patient should be examined again weekly, and the size of the pessary reduced to suit the progressive involution of the vagina. A short time after uterine involution is complete, that is to say, about two months later, the pessary may be removed tentatively, and, if the uterus remains in proper place, its use may be stopped. A permanent cure of a displacement can often be obtained. On the other hand, if the recognition of the displacement is left to chance, and only occurs some months or years later, then pessary cure is probably impossible. In such cases an operation will be necessary, which, while it may redound to the profit of someone else, will not redound to the credit of the practitioner who attended the confinement.

It is well to recognise the existence of perinæal or cervical tears which are either unhealed, or which, in the case of the perinæum, are associated with deep tearing of the levator ani muscle. Should they be found, the patient must be told to return later for further examination.

The detection of any inflammatory condition means that the patient must regard herself as an invalid until it has disappeared. In the case of cellulitis absorption will probably occur within three to six weeks. Tubal disease is another matter.

Its acute stage will either become more acute—this is unusual—or will gradually subside, and the condition become chronic. There may be acute exacerbations at intervals, and an adherent displacement and sterility will almost certainly result. Later, surgical measures may relieve the patient's symptoms, but are unlikely to cure the sterility.

It is thus obvious that the post-natal examination of the patient is a very essential part of the duties of the practitioner. It is a practice which has been much neglected in the past except by the obstetrical specialist, but it is gradually being more widely adopted.

I hope that not many practitioners will find themselves in the position of a medical officer of a maternity hospital, who, when the necessity for a post-natal clinic was pointed out to him, said that his neighbours would not at all like his curing backward displacements with a pessary. Apparently, ventral-suspensions were a favourite operation in that district.

CHAPTER VIII

OBSTETRICAL OPERATIONS IN RELATION TO MATERNAL MORTALITY

It may seem odd to begin a chapter with a truism, still I am going to do so. The object of obstetrical operations is to save health and life. It may be maternal health and life, and it may be foetal. Probably it is both, as the two are so closely interwoven. The main thing to remember is that it is to do one or the other, or both, and that there is no other justifiable reason for an obstetrical operation. As I have said, the remark is a truism. Unfortunately, there are far too many people whose practices prove that they regard it as something quite different, and sometimes they find sympathisers.

Take the case of Dr. Potter of New York. As I understand him, his reasoning leads him to believe that the more women he can deliver in a day, the better for the inhabitants of New York. The idea of the women delivering themselves does not apparently arise. The process takes too long. Only by operative interference can he do the greatest amount of good, or harm, according to the point of view of his critics, to the greatest number of women. Accordingly, he decided that in every case he would dilate the cervix manually shortly after labour began,

turn the normal vertex presentation into an abnormal foot or feet presentation, and extract the child. Nature had endowed him with considerable manipulative skill. Opportunity had given him the surroundings of a first-class hospital. Consequently, he carried out his methods with comparative impunity.

For a number of years the American Medical Society refused to allow him to discuss his methods at its meetings. Then it allowed him to do so. He gained a great deal of praise for his manipulative skill, and some converts. However, the majority of practitioners in a hurry did not possess sufficient skill to enable them to imitate him, nor had they sufficient standing to make them, like Dr. Potter, essential to their patients. The necessary consequence was that, so far as I know, he has not had many successful imitators.

Here then is a very definite instance of a man who did not consider my initial statement to be a truism.

I am afraid that there are thousands of others like him, and that the operations for which they have supplied other general indications than these I have mentioned are the application of the forceps, Cæsarean section, and to a less degree artificial dilatation of the cervix and premature removal of the placenta.

In the following chapter I propose to discuss the abuse of these operations, and to suggest how such abuse may be avoided, and why it is necessary to avoid it.

The Abuse of the Midwifery Forceps.—The application of the forceps is an operation which is necessary for the material welfare of mother or child in approximately from five to eight per cent. of all labours. I wish to note that under the term “material welfare” I include cases in which the forceps is applied to relieve unnecessary suffering that cannot be relieved by less drastic measures. Further, that by “unnecessary suffering” I mean suffering that can be relieved by delivery when such delivery is possible without causing injury to either mother or child.

The latter qualification is very necessary. Forceps applications fall into two classes—those that are safe and easy, and those that are difficult and dangerous. When labour has reached a stage that delivery by the forceps is safe and easy, and consequently that delivery is possible without causing injury to mother or child, it is quite permissible to apply it in order to avoid suffering that cannot be relieved by other means.

When, on the other hand, the complications that make delivery difficult and dangerous are present, as they are, for example, in a case of contracted pelvis in which the head is slowly moulding through the brim, and when consequently a forcible delivery is liable to cause some injury to both mother and child, suffering alone cannot be regarded as a sufficient indication.

Sir William Smyly used to tell a story of a case in which he was watching a primipara trying successfully to mould a head through a slightly narrowed brim. Labour was prolonged and painful. “Can

you do nothing, Doctor?" asked the husband at intervals. Sir William shook his head. At last the question got too insistent—"Can you do nothing, Doctor?" "I can," answered Sir William. "What can you do?" asked the husband eagerly. "Mischief," replied Sir William.

We can all do mischief in such cases with the greatest ease, and, unfortunately, short of doing pubiotomy, there is little else we can do. Luckily there is some compensation for the mother's pain, and it is to be found in her emergence from her labour in an uninjured condition, and with a baby whose brain has not been permanently affected by violent efforts at its extraction.

Much of the most serious forms of the abuse of the forceps is due to people who insist on regarding contracted pelvis as an indication for its application. Contracted pelvis is a contra-indication to the use of the forceps, just as most forms of cardiac disease are a contra-indication to a general anæsthetic. It may, however, be necessary to give a general anæsthetic in cardiac disease to avoid a greater risk, and similarly in contracted pelvis it may be necessary to apply the forceps to save the life of the mother and child. It is the danger to one or other of the latter that is the indication, and not the contracted pelvis. I may seem to be splitting words, but if so, it is with a purpose. If medical practitioners could only be induced to recognise that contracted pelvis is a contra-indication to forceps, we should not hear of the many cases of "failed forceps" which result from premature efforts to save the mother pain,

or to help the infant, or, worst of all, to "hurry things up."

Women with slight degrees of contraction pay many times over for attempts to drag an unmoulded head through a narrow brim in order to shorten their suffering. Severe laceration of the genital tract is one of the least consequences, while amongst the more serious are the formation of fistulæ, and local or perhaps even general sepsis. Children are born dead, die after birth, or grow up with impaired mental faculties. It is very difficult in these cases to hasten the delivery of the child without injuring the child, and, if uterine contractions of the normal strength will not mould the head through the brim, then the forceps is very unlikely to save the child's life. It is only when the mother's condition calls for immediate delivery, and Cæsarean section or pubiotomy is out of the question, and the child is alive, that tentative efforts may be made to extract the latter with forceps as an alternative to craniotomy. Sometimes the operation succeeds, especially when the failure of the head to pass the brim is due more to the insufficient strength of the uterine contractions than to the actual disproportion.

A forceps case of this kind demands extreme skill and judgment on the part of the operator. His efforts must not be too violent or too prolonged, and, when they fail, as they probably will, he must be prepared to go straight on to craniotomy. It is a most unpleasant position for any obstetrician, and one of my reasons for advocating prophylactic

pubiotomy in the lesser degrees of contraction is to avoid placing him in it.

The unsuccessful cases furnish one form of "failed forceps." Still the attempts may have been justifiable, though I do not like the principles of treatment which usually lead to it. There is another form, however, and it is the result of haste and ignorance.

Douglas Miller in a paper on "Unsuccessful Forceps Cases" (*Brit. Med. Journ.* August 4th, 1928) analyses the eventual method of delivery adopted, and the results obtained, in 211 cases admitted to hospital after a "failed forceps" operation. They are as follows :—

Method of delivery.	No. of cases.	Children dead or dying on admission.	Maternal deaths.	Fœtal deaths.
Spontaneous . . .	13	6	0	7
Low forceps . . .	65	15	3	27
High forceps . . .	15	2	2	11
Version . . .	8	1	2	6
Craniotomy . . .	98	82	20	98
Cæsarean section . .	12	3	2	5
Total . . .	211	109	29	154

He adds : " It is significant that in none of the three centres from which the cases under analyses had been drawn " (Edinburgh, Glasgow, Manchester) " was delivery in any case effected by pubiotomy." If this sentence means that the neglect of the operation shows all the cases to have been infected, such neglect was very proper. If, however,

it means that at these three centres the operators have not had any experience of pubiotomy and do not mean to have any, then I think the attitude is unfortunate. Still, it in no way affects what I have said in regard to prophylactic pubiotomy. The results of the latter differ as much from those of pubiotomy done after a failed forceps, as do the results of an easy Cæsarean section from those mentioned in Miller's paper.

Miller also analyses 151 cases of "failed forceps," in which no reason could be found for failure other than their premature application. The eventual method of delivery adopted and the results are as follows :—

Method of delivery.	No. of cases.	On Admission.		Maternal deaths.	Foetal deaths.
		Incom- plete dilatation of cervix.	Children dead or dying.		
Spontaneous .	47	20	8	1	15
Forceps . .	75	41	24	6	37
Version . .	9	6	3	1	7
Craniotomy .	18	12	16	0	18
Cæsarean section	2	2	1	1	1
Total . .	151	81	52	9	78

He also gives a third table which shows that in 161 cases of occipito-posterior position, in which the forceps was applied prematurely and failed, sixteen

mothers and a hundred children died. He then continues :—

“ The tragic loss of life, maternal and foetal, associated with different types of unsuccessful forceps cases has already been referred to in different parts of this paper. In all, 54 patients died, a mortality of ten per cent., and one which is scarcely exceeded by any of the major complications of pregnancy or labour. The individual causes of death were : sepsis, 37 ; rupture of the uterus, 8 ; post-partum hæmorrhage and shock, 6 ; and pneumonia, 3.

“ In addition, in 132 cases (23·6 per cent. of the total series) the puerperium was morbid according to the British Medical Association standard. Many of the patients recovered sufficiently to leave hospital only after exhausting weeks of fever. Including still-births and neo-natal deaths, 357 of the infants were lost—a mortality of sixty-four per cent.”

The conditions which make the application of the forceps safe and easy are as well known as they are widely neglected. They are usually stated to be as follows :—

(1) A foetal head presenting by the vertex, and whose largest presenting diameter has passed the pelvic brim.

(2) A cervix that is fully dilated and retracted.

I think it is necessary to add a third essential :—

(3) A possibility of carrying out full obstetrical asepsis.

When these conditions are fulfilled the application of the forceps is permissible in the presence of any

of the usual indications for immediate delivery, and the operation can be readily done by a medical practitioner who has received the usually prescribed obstetrical education. When these conditions are not fulfilled, delivery by the forceps is contra-indicated except as a last resource. Under such conditions, the operation is one which needs the greatest skill and experience.

As there is a widespread belief amongst obstetricians that the rate of application of the forceps in private practice, and especially amongst general practitioners, is excessive, it may be interesting to give statistics, collected by the Health Department of New Zealand, bearing on this point. It may also be of interest to relate the efforts which have been made to bring home to the worst offenders against recognised views the extent to which they are breaking away from them.

I am inclined to think that the use and abuse of the forceps in this country differs little from its use and abuse elsewhere, and that the figures I am about to give are very similar to those which are to be found in Great Britain.

There are some 276 public and private maternity hospitals in New Zealand. In 1927, 16,656 births occurred in them, a figure which represents approximately four-sevenths of the total births of the country. Each hospital is obliged to send in a monthly report, which I have already described, to the local Medical Officer of Health, and this report, though in some respects not so exact as is desirable, is probably accurate in regard to forceps deliveries.

An examination of these returns, for 1927, shows that very marked differences occurred in the rate of application of the midwifery forceps in the practice of these hospitals. This variation is as great as from nothing per cent. to seventy-eight per cent. The average rate for the whole country was 12.51 per cent. In hospitals with less than fifty admissions in the year it was 15.06 per cent. In hospitals with between 50 and 100 deliveries, it was 12.63 per cent. In hospitals with between 100 and 150 deliveries, it was 16.29 per cent. In hospitals with more than 150 deliveries annually it was 7.35 per cent. Accordingly, it was decided to write to the staff of those hospitals of which the figures very grossly exceeded the average for the country, and to ask if they had any explanation to suggest. The figure of "very gross excess" was taken as forty per cent., and thirteen hospitals were concerned. When their answers were received the following memorandum was sent out, and, as it is pertinent to the subject under discussion, I include it here.

"It is well to begin by assuming two things: First, that all medical practitioners are actuated by the desire to do their best for their patients; and, secondly, that it is not in the interests of patients that normal labours should be terminated in an operative fashion.

"I do not propose to labour either of these two points. The first ought to be self-evident, the second is self-evident. I think it will be more profitable to try to look for an explanation of the unduly high rate that is found sporadically through the country.

“ There are various explanations which suggested themselves. The first, and perhaps the most obvious, is lack of obstetrical experience. Then come such reasons as undue anxiety on the part of the medical attendant, undue pressure by the patient's relatives, unsatisfactory management of the first stage of labour, insufficient use of the various means of lessening pain during both the first and second stages.

“ It will be noted that all the reasons given in the last sentence might have been grouped under the head of obstetrical inexperience, but, unfortunately, they also are to be found existing separately when lack of experience should have ceased to exist. It is possible to suggest a remedy in such cases, if the medical practitioners concerned will adopt it. Where actual inexperience is present, it is more difficult to do so.

“ Competent ante-natal care is a fruitful way of lessening the anxiety of the medical practitioner during labour. If it is known that a patient begins labour in a normal state, it is *ipso facto* known that there is probably only a five to ten per cent. prospect of her requiring forceps delivery. It is also known that the patient will require little medical attention during the first stage of labour. When, on the other hand, difficulty is anticipated, then medical attention is urgently required, but undue anxiety can be avoided by the careful watching of the patient's temperature, pulse, uterine contractions, etc.

“ Undue pressure by the patient's friends is a complication from which all young practitioners will

suffer. On the other hand, if a medical man, who has his patient's confidence and who has been in practice for a long time in the same place, finds himself hampered by it, there is something wrong somewhere. His patients ought to know that he is the person who is most competent to advise. Where, however, a medical man has been established in a district for many years, and has habitually adopted the too frequent application of the forceps, the force of his example makes it very difficult for his medical neighbours to refrain from following him. Such men should remember that not only is their practice calculated to do injury to their own patients, but also to an even greater degree to the patients of their less experienced neighbours.

“ I think that a quotation from a recently published report of the Louise Margaret Hospital, at Aldershot, by Lieut.-Colonel P. C. T. Davy, C.M.G., R.A.M.C., is pertinent to the matter under discussion. ‘ That institutional midwifery is of immense advantage to the woman admits of little argument, but one is inclined to think that perhaps its most incalculable benefit lies (or should lie) in saving her from the obstetrical forceps. Removed from anxious relatives, under the constant observation of a staff to whom time is no object, and in the atmosphere of calm routine which prevails, Nature, who after all is not a bad midwife, is allowed a hand. The ultimate good to the woman undoubtedly lies in patience. This counsel of perfection, of course, breaks down too often in other circumstances, but conscientious ante-natal examination should do much to preserve

it.' (*Journ. of the R.A.M.C.*, January, 1928, p. 19.)

"Colonel Davy deals with 2,200 confinements, and the average rate of forceps application was four per cent.

"Unsatisfactory management of the first stage of labour is a fertile cause of unnecessary forceps application. Perhaps the main faults might be summed up under the head of insufficient nourishment, insufficient exercise, and excess of relievable pain.

"A patient who takes her nourishment well, whose mind is distracted from her condition by walking about, chatting, and doing odd little jobs of play or work until the time comes for her to go to bed, comes into the second stage in a condition of well-being that helps her to help herself to the required extent. When uterine contractions are severe, the judicious use of morphia is of inestimable value. Very many patients are found early in the second stage in such a condition of nervous worry and consequent exhaustion that early delivery is imperative, who would never have been so placed if morphia had been used in a sensible manner.

"I doubt very much if medical practitioners realise that the average duration of the second stage of labour in a primipara is from one to two hours, and in a multipara from ten to fifteen minutes. Assuming these figures to be correct, it is an interesting question to ask, at what stage of labour is it necessary to apply the forceps in order to get it on to forty per cent. of cases? To me it seems obvious

that it must be applied long before it is possible for the most normal patient to terminate her own labour normally.

“ Putting this aspect of the question aside, there is no doubt that the most effective means, during the second stage, of preventing the necessity for forceps application is again the relief of pain. Such relief can be obtained by the administration of chloroform to the obstetrical degree. Such degree of anæsthesia can be best and most safely obtained by the use of Murphy’s inhaler. I think it is a pertinent question to ask, how many practitioners, whose forceps average is too high, make effective use of obstetrical anæsthesia, not merely when the head is passing over the perinæum, but throughout the second stage. If they make such use, and if they still find that the suffering of the patient, or the persistence of her friends, force them to apply the forceps, I feel that they can claim some justification. If they do not avail themselves of the advantages of anæsthesia, then they are largely responsible for the result.

“ Next in importance to the relief of pain comes the removal of such temporary obstacles as a full bladder, a loaded rectum, or such lateral or anterior deviations of the uterine axis as bring it out of line with the axis of the pelvic brim. The timely use of a catheter, the administration of an enema, or the application of an abdominal binder saves many a patient from the instrumental delivery which might otherwise have been necessary.”

The individual answers received showed that, while the majority of the writers were obviously

persuaded that they had acted in the best interests of their patients, their reasons for so thinking differed very markedly. As the matter is of very great importance, and as I want to be absolutely fair to the views of medical practitioners, I give some of them and my comments thereon :—

Dr. "A" gives as his reasons for one of the highest forceps rates in the Dominion "delay on the perinæum, unusually large heads endangering infant life, and when pituitrin is contra-indicated." I suggested that he should consult the Report of the Director-General of Health for 1926, where he will find quoted the statistics of the Queen Victoria Jubilee Institute. He will see that about 50,000 patients were attended by nurses, with the assistance in difficult cases of general practitioners. He will see that the gross mortality including concurrent disease was 2·4 per thousand, and that the rate of forceps applications was 6·4 per cent. With these figures before one and also the statistics of this Dominion generally, it is impossible to regard his reasons as adequate.

Dr. "B" is in the habit, "when the head is on the perinæum, of extracting the child with forceps (but not actually delivering). The idea behind this practice is to relieve the perinæal muscles and save tears. The actual number of essential forceps cases would not be more than five" (? per cent.). I do not think that this practice has ever been sanctioned by general obstetrical opinion. Personally, I know of no prominent obstetrician who advises it. I have seen claims made that to deliver the child

by the axis-traction forceps saved laceration, but here again I think few people agree with such an opinion. Perhaps the most obvious statement I can make regarding Dr. "B's" practice is that intra-vaginal manipulations, unless entirely unavoidable in the interests of either mother or child, are contrary to the teaching of modern obstetrics. The particular practice he adopts causes a much increased risk of infection without any compensatory benefit. Accordingly, I think it ought to be abandoned. I then drew the attention of Dr. "A" to Dr. "B's" idea of the frequency of *essential* forceps application.

Dr. "C" sends a reply which is just the opposite of Dr. "B," as he frequently uses the forceps to prevent laceration, but goes on to deliver the head by this means. I think there is possibly more reason in his method than in Dr. "B's," but still I do not think there is sufficient reason to justify it. Dr. Potter of New York uses very similar arguments to justify his practice of dilating the cervix artificially in every case, turning the foetus, and extracting it. In other words, Nature in his opinion has become so inefficient in New York that it must be replaced by Dr. Potter. I do not think it has, nor that it has become so inefficient in the district under discussion that it must be replaced by Dr. "C."

Dr. "D" does not agree that seventeen forceps applications amongst thirty-three confinements is a high forceps percentage. He admits, but "not in any boastful manner, that the proportion was less the previous year," and says that such lessening was "due to the presence of probationers." This

reference seems to necessitate one of two conclusions, either that when probationers were present the forceps was not applied when its use was indicated, or that, in the absence of probationers, the forceps was applied when it was unnecessary to do so. I am sure he does not intend to convey either of these two conclusions. Then he says that he wishes to point out "the utter futility from a practical point of view of comparing forceps percentage in private practice with those taken from the St. Helens Hospitals, the Rotunda, and other semi-charitable institutions," and adds that fifty per cent. is about an average percentage in private practice. This again seems to lead inevitably to one of two conclusions: that patients in "semi-charitable institutions" are neglected, or that patients in private practice are subjected to unnecessary forceps application. I do not think Dr. "D" intends to suggest the former view, and apparently he is not prepared to adopt the latter view.

Three replies are very similar. They all expressed the view that the medical practitioner concerned acts as he thinks best in each individual case, and that he invariably uses his knowledge and skill to the best interests of the patient. I have already assumed the existence of such a state of affairs in all cases. Unfortunately, the general assumption, or the individual statement, does not explain actions when these are so very widely opposed to general teaching and knowledge.

The views expressed above are by no means peculiar to this country any more than is the abuse

of the forceps. It may be said that they are the views of men of an older school of midwifery teaching. That is so in some cases. It is, however, by no means universally true, as is shown by the answer I have already quoted of a young practitioner: "I haven't yet decided if I shall do as I have been taught, or as everyone else does."

Further opinions on the abuse of the forceps will be found in Chapter X.

It is easy to understand how the difficulties and exigencies of general practice tend to urge the practitioner to shorten labour cases as much as he can. It is also easy to sympathise with his position. Still, neither understanding nor sympathy alter the fact that the premature application of the forceps causes mechanical injury to both mother and child, and that all internal manipulations, especially when accompanied by mechanical injury, and whether premature or not, increase the danger of septic infection. Therefore, unnecessary interference must be forbidden. It is the difficulty of reconciling two competing interests—the patient's and the general practitioner's—which has led me to support the view, already strongly held by well-known obstetricians, that the conduct of normal cases of labour should be entrusted to midwives.

The introduction of such a system will, however, benefit only the normal case. The treatment of the abnormal case must still belong to the medical practitioner, and, if present conditions remain, such cases will still continue to furnish their unnecessary quota of maternal deaths. To prevent such deaths

two further steps are necessary—systematic ante-natal diagnosis to enable us to recognise the presence of complication-causing factors before the complications occur, and better medical education.

When the time comes that all patients receive efficient ante-natal care, that the management of normal labour is left to midwives, and that medical students receive an effective training in midwifery, there will be little further heard of the abuse of the forceps, of “failed forceps,” and of their sequelæ.

THE ABUSE OF CÆSAREAN SECTION¹

I have one great difficulty in writing on the abuse of Cæsarean section, and that is that almost everything I can say on the subject has been anticipated by Professor Whitridge Williams, of Baltimore, and has been put much better than I can put it. In what I have got to say, however, I am not merely adopting his views. My own have been formed independently, but they coincide with his, and consequently it is difficult to avoid re-echoing his thunder. On the other hand, it is a very great advantage to have his authority to support my own attitude.

In 1916, when addressing the Clinical Congress of Surgeons of North America, he spoke as follows :—

Unfortunately history shows that advances in the practice of medicine and surgery are rarely attained in a thoroughly rational manner, but that a period of undue enthusiasm, or even of almost reckless abuse, usually precedes the establishment of the actual value of a given procedure.

. . . I believe that we are at present going through such a stage in connection with Cæsarean section.

¹ I reprint here the greater part of a paper read at the Second Australasian Medical Congress, Dunedin, New Zealand, 1927.

Again in the last edition of his "Obstetrics" he writes as follows :—

With the increasing perfection of surgical technique and an erroneous idea of the safety of the operation, there seems to be a growing tendency to regard Cæsarean section as the simplest means of coping with most obstetrical difficulties. At the present time I consider that the operation is being abused and that not a few patients are sacrificed to the *furor operativus* of obstetricians and general surgeons who are ignorant of the fundamental principles of the obstetric art. This being the case, the conscientious obstetrician should be particularly careful in the recognition of indications for Cæsarean section.

It would be an easy matter to quote similar opinions presented by other writers, but I think Williams's authority is sufficient. I think, too, that it, together with the statistics which I shall put before you, will establish my two main points : Firstly, that Cæsarean section should be avoided whenever possible, on account both of its immediate risk and of its possibly crippling effect on the patient. Secondly, that Cæsarean section is seldom necessary, because the art of midwifery provides a more satisfactory alternative.

The mortality following Cæsarean section varies directly according to the stage at which the operation is done. The figures collected by Holland in 1921 prove this very clearly. Cæsarean section for contracted pelvis done before labour begins caused a mortality of 1·4 per cent. ; early in labour a mortality of 1·8 per cent., late in labour a mortality of ten per cent., after a preliminary induction of labour a mortality of fourteen per cent., after attempted forceps a mortality of 25·7 per cent., after attempted craniotomy a mortality of fifty per cent. I wish

to emphasise the fact that, even when the operation was done under the most favourable circumstances, the mortality was 1·4 per cent.

This is a low mortality, lower perhaps than is actually the case. Williams's corrected statistics for all cases in his hospital, corrected by the exclusion of deaths which were not attributable to the operation, give a mortality of 3·35 per cent. He divides his cases into two periods. In the first period he operated at any time during labour, often after a prolonged second stage. The mortality was twelve per cent. In the second period the operation whenever possible was done before or a few hours after the onset of labour. The mortality was 2·45 per cent. Further, he considers that the general mortality in the United States of all women in labour is ten per cent.

The cost of Cæsarean section done late in labour is very high. As Williams says, the evidence is clear that whenever a considerable time has elapsed between the onset of labour and the performance of Cæsarean section, we must take into consideration the probable existence of a latent infection which may later give rise to a general peritonitis. To prevent this there is apparently only one remedy, and that is to substitute a radical for a conservative operation and to remove the uterus. Such a course reduces the mortality very markedly. Williams records 56 cases with a mortality of 1·8 per cent. It is, however, a high price for a young woman to have to pay.

Perhaps if it were possible to get into the mind

of the operator who unnecessarily resorts to Cæsarean section late in the second stage, that his duty is to remove the uterus as well as the infant, it might induce him to try obstetrical methods of delivery before resorting to surgical ones.

I think we may take it as a fact that every case in which an unforeseen Cæsarean section has to be done for obstructed labour, is directly due to a failure of diagnosis, that is in the great majority of cases to insufficient or inefficient ante-natal care. I do not mean to suggest that diagnosis is always possible. Theoretically it may be. Practically it may not. I think, however, that if you examine the causes of obstruction that cannot be recognised before or at the beginning of labour, you will find that the correct treatment for most of them is not Cæsarean section. Ante-natal care and diagnosis is one of the surest ways of avoiding unnecessary operations, of enabling us to do the necessary ones at the proper time and so of reducing the mortality to a fifth of what it would otherwise have been.

I am quite aware that it is customary in many places to practise in contracted pelvis what is called the test of labour and, if delivery fails, to perform a Cæsarean section late in labour. I cannot give a general approval to such a course. In the first place careful examination and internal measurement with Skutsch's pelvimeter will usually enable us to decide whether Cæsarean section is the proper course to adopt, while, if there is a reasonable prospect that the patient will deliver herself and she fails to do so, pubiotomy is preferable, especially

in multiparæ. There are undoubtedly border-line cases in which an exact prognosis is impossible, and in such the obstetrician who attends them must decide according to his own views. I would like, however, emphatically to protest against the idea that a test labour can be substituted for exact preliminary diagnosis, because the object of the latter is to exclude as far as is possible the necessity for the former. I shall not go further into the matter as it is to be brought before the meeting later.

The risks of Cæsarean section do not end with the convalescence of the patient, because there is in all cases the danger that a permanent injury may result to the uterine wall, which is thereby thinned and prone to tear during a subsequent labour. Theoretically, it should be possible to produce a union of the incision which after a short time is indistinguishable in appearance or strength from the rest of the muscle. Practically, there is always the risk that unsuitable suture material, bad suturing or sepsis of the wound may cause a weakening of the scar. That the risk is a real one is shown by Holland's collected statistics. Seventy women were delivered or delivered themselves through the vagina after a previous Cæsarean section and in eighteen or about twenty-three per cent. the scar ruptured during labour. Rupture during pregnancy is rarer, but it, too, may occur.

Again, peritoneal adhesions, while they are not necessarily dangerous to life and may be symptomless, are not an advantage. Williams, in forty-eight women who had been operated on in his own clinic,

found subsequent " broad or dense adhesions " in a third. In others who had been operated on elsewhere he found them still more frequently.

Accordingly a young woman on whom Cæsarean section is done, may be left in such a state that she is unable to have a normal labour subsequently ; she may be rendered permanently sterile by the loss of her uterus or she may lose her life from the risks inseparable from the operation. The obvious conclusion from these facts is that Cæsarean section must be avoided whenever it is possible to do so.

What are the conditions in the treatment of which Cæsarean section is most abused ? The three most common are probably the milder degrees of contracted pelvis, eclampsia and placenta prævia.

The milder degrees of contracted pelvis offer perhaps the largest field for the irresponsible operator. As Williams puts it : " I have been reluctantly forced to the conclusion that, in many parts of the country, the mere diagnosis of a contracted pelvis, irrespective of degree, is considered a satisfactory indication for the operation."

There are usually considered to be four degrees of contracted pelvis. In flat pelvises whose true conjugate measures 8.25 centimetres (3.25 inches) or more, there is very seldom an indication for operation. When the conjugate measures between 8.25 and 7.0 centimetres ($3\frac{1}{4}$ to $2\frac{3}{4}$ inches), Cæsarean section is permissible, but can be replaced by the induction of premature labour or by pubiotomy. In the other two degrees, Cæsarean section is positively indicated. The vast majority of contracted pelvises

fall into the first or the upper limit of the second degree ; Williams places it at about ninety-five per cent., and of these eighty per cent. deliver themselves spontaneously. The selection of the correct line of treatment is entirely a matter of exact diagnosis, as made by internal and external measurement of the pelvis and by estimating the relation of the fœtal head to the pelvic brim. External measurement alone is valueless. A general practitioner who had not had a very large midwifery experience is most unwise to undertake the management of such cases, and the routine performance of Cæsarean section does not lessen his responsibility.

To the obstetrician whose experience entitles him to treat such cases, I should like to say : “ Learn how to use Skutsch’s pelvimeter. There is no mystery about it. The ordinary mechanic learns to use measuring instruments which are much more difficult to handle. You can learn its use on the dummy almost as well as on the patient. It is usually necessary to give an anæsthetic, but the number of women who must be measured internally is very small. If it was a question of an ordinary gynæcological examination you would not hesitate to give an anæsthetic if necessary. Why should you hesitate when the welfare and perhaps the life of both mother and child are at stake ? It is necessary to exhaust all the powers of diagnosis before you advise your patient that a Cæsarean section is unavoidable.”

Eclampsia is probably the next most common cause of the abuse of Cæsarean section, and that,

too, in spite of the fact that its results prove it to be almost the most fatal line of treatment.

Eden in 1922 published an exhaustive analysis of the results of eclampsia as treated in Great Britain and Ireland. One of his conclusions was that both in mild and in severe cases Cæsarean section and *accouchement forcé* were followed by the highest mortality—a mortality which Holland found to amount to thirty-two per cent. after Cæsarean section.

Petersen found that in the United States the mortality of eclampsia radically treated was 34·8 per cent., and Williams at Baltimore prior to 1916 treated by radical measures 85 cases with mortality of 24·7 per cent.

In Germany Engelmann reported a mortality of twenty-six per cent and Lichtenstein a mortality of 16·7 per cent.

The results of conservative treatment, on the other hand, are given as follows : Williams was able to report a mortality of thirteen per cent., Engelmann of six per cent., and Lichtenstein of 9·4 per cent. after they had changed round to conservative treatment. Fitzgibbon and Solomons reported 204 cases with a mortality of 10·3 per cent. Windeyer at Sydney treated 158 patients with a mortality of 6·9 per cent. Stroganoff collected 3,302 cases treated by his method with a mortality of 10·4 per cent., while in more than 230 cases which he treated personally the mortality was 2·5 per cent. Incidentally, I may say that he stated that the mortality in New Zealand was 25 per cent., but I do not know

where he got his figures. The statistics which I am just about to quote show a mortality of 22·9 per cent.

What my friend laughed at then seems to have been methods of treating eclampsia which reduced a mortality of between 16·7 and thirty-four per cent, to one of between two and thirteen per cent. Even in his own country of New Zealand facts are against him. I have recently analysed the results of 149 cases of eclampsia reported by different medical practitioners. Conservative treatment in 104 cases gave a mortality of 15·38 per cent. ; Cæsarean section in 29 cases of 27·5 per cent., and *accouchement forcé* and allied procedures in 16 cases of 43·7 per cent. I have no reason to think that the cases treated by Cæsarean section were any more serious than those treated conservatively.

It is generally recognised that there is a place for Cæsarean section in the treatment of eclampsia, but that it is a very small one ; practically speaking it is only to be found amongst the cases in which conservative treatment has failed to bring about any improvement.

Placenta prævia comes next, and here, too, the results obtained from Cæsarean section, as compared with those of more conservative measures, are directly opposed to its routine use. Holland reported that the mortality in the British Isles after Cæsarean section in 139 cases was 11·5 per cent. R. W. Holmes estimated that the similar mortality in the United States was twenty per cent. On the other hand, purely obstetrical treatment has

given the following results. Williams, who uses the Champetier de Ribes's bag, had one death in forty cases, or 2·5 per cent. Hofmeir, Behm, Lomer, Essen-Möller, Pinard and Stratz have recorded a total of 603 cases treated by Braxton Hicks's method with a mortality of 2·9 per cent. I recorded a short time ago 264 cases which had occurred at the Rotunda Hospital with a mortality of 5·3 per cent. I am able to say that a number of the patients who died were moribund on admission and could not have been treated by Cæsarean section. If these cases are excluded, as they should be in any comparison with the results of Cæsarean section, the mortality would have been about three per cent.

At the East End Maternity Hospital during 1926 and 1927, 4,173 patients were confined. There were no cases of Cæsarean section, and embryotomy was never necessary. There were 29 cases of placenta prævia without a maternal death. The foetal mortality in these cases was necessarily very high. It is probable that some of these infants might have been saved by Cæsarean section, but the important point is that, from the mothers' point of view, operation was unnecessary. When it is possible to save infant life without injury to the mother, I do not want to decry the value of the operation, but in the treatment of placenta prævia when the mother is weakened by previous hæmorrhages and the infant is moribund, or dead, I do not think there is any place for it. I think it will be found that when it is done in such cases the operator is usually a general surgeon with no special obstetrical experience.

There is a place for Cæsarean section in the treatment of placenta prævia just as there is in treatment of eclampsia, but it is only in those cases which ante-natal care has enabled us to recognise before severe bleeding has occurred, and when the child is viable.

There are still a few conditions left which serve as reasons or excuses for Cæsarean section. Mal-presentation of the fœtus is one of them. I think that since I was qualified I have known personally of two cases in which Cæsarean section was done for transverse presentation. In one the mother died, in the other both mother and child lived. The former was catastrophic, the latter peculiar. In the morning an hour and a half after the rupture of the membranes, the medical attendant found a transverse presentation by external examination. He did nothing. In the evening he found the cord and a hand in the cervix by internal examination. He gave the patient morphine. The next morning, as meconium was coming away, he did a Cæsarean section. The patient was twenty-four and had had two normal confinements. His reason for his treatment was that the uterus was throughout in a state of tonic contraction, but the fact that the child was alive and well twenty-four hours after the membranes ruptured is rather opposed to this. No attempt was made to see if the contraction would pass off under an anæsthetic or to correct the presentation by internal version.

I would like to make the following suggestions : Firstly, that almost every case of neglected shoulder

presentation in which the child is alive, can be changed to a foot presentation by internal version. Secondly, that if the presentation cannot be changed, the amount of force required to bring the fœtus out of the pelvis during a Cæsarean section must be so great as to be injurious to the uterus. Thirdly, that the patient in such a case would almost invariably be infected, and that consequently a hysterectomy is always necessary. Fourthly, that when the child is dead, there is no possible indication for Cæsarean section.

I have the records of 209 cases of transverse presentation treated in the Rotunda Hospital. I do not think that decapitation has ever been done on a living child nor has delivery ever been effected by Cæsarean section. In other words, in every such case it has been possible to correct the presentation.

I am, of course, excluding cases in which operation may be necessary, not on account of the presentation, but because the pelvis is contracted or other form of gross obstruction exists.

I said that there was a tiny place for Cæsarean section in the treatment of placenta prævia. I do not think there is even this place for it in the treatment of transverse presentation.

Time will not allow me to discuss the other forms of obstructed labour that have been used as a reason or an excuse for Cæsarean section. There are undoubtedly several forms in which the operation may be necessary, and amongst them I am afraid that rigidity of the cervix is sometimes included. I had thought that this ancient bugbear of the obstetrician

had passed away with the midwife who kept her fingers in the vagina throughout labour. Still, should a *bonâ fide* instance of it occur, I am inclined to think that it should be possible to remove it by obstetrical measures, instead of removing the child by surgical ones.

There is a glamour which attaches itself to the operation of Cæsarean section in the minds of the public and a kind of spurious fame, more rightly called notoriety, that surrounds the operator and that can cause a sympathetic reaction in his mind. Some of us may remember old descriptions of operative scenes in which a self-conscious operator extracted a baby through a uterine incision, much as a conjurer extracts a rabbit from a top hat, while his class wildly applauded. This kind of thing has passed away, but in small communities the glamour and the spurious fame still remain, to the detriment of the bodies of patients and the minds of their medical advisers. I am sure there is no need here to warn against any attempts to encourage such absurdity, but perhaps it is well to suggest the wisdom of definite efforts to kill it. I know no better way of so doing than by medical men bringing their patients to recognise that, as I have said before, practically every case in which an unforeseen Cæsarean section due to obstructed labour is necessary, is directly due—at any rate theoretically—to insufficient or inefficient ante-natal care. Moreover, I am quite sure that, whether with or without medical guidance, the public will some day recognise the fact for themselves. It is entirely preferable,

when this happens, that the medical profession should be able to say : " We told you so."

I may summarise briefly the conclusions which I think must be drawn from the facts I have put before you.

(1) Cæsarean section done under the most favourable conditions is associated with a mortality of nearly two per cent., and may be followed by peritoneal adhesions and subsequent rupture of the scar.

(2) Cæsarean section done under unfavourable conditions is followed by a mortality of from ten to fifty per cent., and, in patients who survive, the risk of after complications is greater.

(3) The only way of avoiding such operations is careful ante-natal diagnosis, and the only way of reducing their mortality when they are necessary is to remove the uterus.

(4) Unless there is good reason for thinking that the uterine incision has healed satisfactorily, it may be unwise to allow a patient to deliver herself at subsequent pregnancies.

(5) The treatment of eclampsia by Cæsarean section is followed by a mortality of from sixteen to thirty-four per cent. Conservative treatment is followed by a much lower mortality.

(6) The treatment of placenta prævia by Cæsarean section is followed by a mortality of from eleven to twenty per cent. Obstetrical treatment is followed by a much lower mortality.

(7) The necessity for treating a transverse presentation by Cæsarean section is almost unknown.

When it occurs, it is also necessary to remove the uterus.

(8) The statistics of hospitals in which Cæsarean section is extensively done, unless they are based on a foundation quite distinct from that of other maternity hospitals, do not offer any encouragement to those who would imitate their producers.

The Abuse of other Obstetrical Operations.—Once we exclude Cæsarean section and forceps applica-

Hospital.	Number of deliveries.	Proportion of		Percentage mortality.		
		Cæsarean section.	All operations.	Cæsarean section.	Eclampsia.	Total.
Jefferson, Philadelphia (1921-1924).	1,453	1 in 63	—	—	—	2·3
Boston Lying-in (1924).	1,133	1 in 12	1 in 2·4	7·6	54	2·2
Bellevue, New York (1922).	4,286	1 in 97	—	7	48	2·5
Rotunda Hospital, Dublin (1889-1922).	57,412	1 in 366	1 in 14·5	—	12·5	0·42

tion, the abuse of the other obstetrical operations is not very marked, with the possible exception of the two which I have already mentioned; artificial dilation of the cervix, and manual removal or premature expression of the placenta. I have no means of judging to what extent these procedures are unnecessarily practised, and so I confine myself to pointing out that both of them tend to raise maternal mortality from hæmorrhage and from sepsis.

The general connection between a high operative rate and maternal mortality is strongly suggested by the statistics given in the table, on p. 225, of three American hospitals. In contrast with them I give the corresponding statistics of the Rotunda Hospital.

Is it any wonder that Williams speaks of an abuse of Cæsarean section which can be attributed only to an obsession by the *furor operativus*. I do not know what may be the prime reason for this *furor* in America. In this country its counterpart, when it exists, is due to the fact that the management of difficult labour tends to pass into the hands of the general surgeon, who, skilled as he may be in general surgery, does not possess an intimate acquaintance with the refinement of the obstetrical art. His instincts are surgical, and it is but natural that his remedies should be similar.

CHAPTER IX

THE CAUSES AND PREVENTION OF MATERNAL MORTALITY

I HAVE found it difficult to decide whether the following chapter should be placed first or last. If it comes first, it serves to bring before us the various causes of, and methods of preventing, maternal mortality, and so serves to fix our minds on the relative importance of the different matters under discussion. If it comes last it serves as a *résumé* of what has gone before and crystallises the various factors and remedies that have been suggested. On the whole, I believe that it comes better as the end of my book.

I am inclined to think that there are two conclusions at which we can arrive in regard to maternal mortality. The first is that it is mainly due to "personal" as opposed to "impersonal" causes. The second is that it is to a great extent avoidable.

I must first explain what I mean by personal as opposed to impersonal causes. I regard a death during pregnancy from eclampsia as usually due to a "personal" cause, because, if the patient had lived a normal life, she would not have had eclampsia. I regard a death during pregnancy from advanced chorionic-carcinoma as due to an "impersonal" cause, because there is no known personal factor,

either in the patient or in her obstetrical advisers, that can either prevent or cure it. I regard a death during labour from the rupture of an overstrained uterus as due to a "personal" cause, and a death from the spontaneous rupture of a degenerated uterine wall as due to an "impersonal" one. I regard a death from sepsis during the puerperium as usually due to a "personal" cause, and a death from pulmonary embolus as usually due to an "impersonal" cause, which is tending to become personal as a result of increased knowledge.

What is the object of thus classifying causes? "It is a dull mind that distinguishes in order to divide." The object is a definite one, namely that I want to show that by improvement in the art, practice, and environment of midwifery most of the causes of maternal mortality can become "personal" causes, and that "personal" causes are largely preventable.

Let us take septic deaths as an example. A woman is unavoidably confined under conditions which makes it, humanly speaking, impossible to avoid the possibility of infection. She becomes infected and dies. I regard such a death as, under the circumstances, due to an "impersonal" cause. Her death was, under the circumstances, unavoidable, and the "personal" factor had little or nothing to do with it.

Another woman is confined in a properly constructed maternity hospital, in which it is possible to prevent the passage of infection from one patient to another. She too gets infection and dies. Her

death is due to a "personal" cause, which originates either in herself or in some one else, and which was capable of correction. Hence it can be regarded as avoidable. Avoidance, at the moment, may only be possible in theory, but the theory of to-day can often be turned into the practice of to-morrow. Pulmonary embolus is probably an example of such.

Contracted pelvis is another case in point. A woman with a contracted pelvis is confined on a desert island where no assistance is available. She dies as a result of an obstructed labour, an obviously "impersonal" cause of death because neither she nor anyone else was capable of doing anything to prevent it. Another woman dies from a similar cause in civilisation, and in her case the cause of death is "personal," because she died as a result either of her own failure to obtain medical assistance or because the assistance she obtained was insufficient.

One more instance, and I think my meaning will be clear. If the education of medical practitioners in midwifery is insufficient to enable them to deal in a correct manner with the complications of labour, and if such lack of education is due to circumstances which make it impossible for a proper education to be given, then maternal deaths which result from it may more or less justifiably be said to be due to an "impersonal" cause. If, however, lack of education is due to their own fault, or to the fault of those responsible for their instruction, or if they fail to use the knowledge which they actually possess, then the

deaths which result are due to purely "personal" causes.

If then we can improve the art, practice, and environment of midwifery to the full extent that our present knowledge renders possible, we shall make the great majority of the causes of maternal death

Cause of death.	Total deaths.	Rates per 1,000 live births.
Puerperal sepsis	6,372	1·46
Puerperal albuminuria and convulsions	3,158	0·72
Puerperal hæmorrhage	2,248	0·52
Accidents of pregnancy	1,956	0·45
Other accidents of labour	1,881	0·44
Puerperal embolus and sudden death and phlegmasia dolens	1,434	0·33
Other causes	156	—
Total deaths	17,160	3·96

"personal," and such causes are, in theory at least, almost wholly preventable.

The art of midwifery can be improved by research and practical experience, and by bringing to its aid the ancillary sciences. The practice of midwifery can be improved by raising the knowledge and increasing the experience of those on whom it devolves. The environment of midwifery can be improved by educating the minds of the public to the need for it, and by all such measures as make it possible to

conduct labours under conditions of asepsis and general safety.

The principal causes of maternal death appear to be very much the same in all countries, although the actual number of deaths per thousand live births may differ. The table on p. 230 shows the causes to which maternal deaths were attributed in England and Wales during the six years ending 1927, and the number of deaths which occurred from each cause. There were 4,327,505 births registered during this period.

A similar table for New Zealand for the same period reads as follows. There were 169,494 live births.

Cause of death.	Total deaths.	Rates per 1,000 live births.
Puerperal sepsis including septic abortion and miscarriage .	307	1·82
Puerperal albuminuria and convulsions	195	1·16
Puerperal hæmorrhage . . .	117	0·69
Accidents of pregnancy . . .	82	0·49
Puerperal embolus and sudden death, phlegmasia dolens .	62	0·37
Other accidents of labour . .	49	0·29
Other causes	9	—
Total deaths	821	4·87

The causes of death in the above list have been placed in order of frequency, and it will be noted that the order in the two lists is almost identical.

Sepsis is by far the most common single cause of death, and then, some way behind, come albuminuria and convulsions, hæmorrhages, the accidents of labour and pregnancy, and pulmonary embolus.

It is very fortunate, from the point of view of the practical obstetrician, that official statisticians cannot adopt a clearer terminology, and are unable to refer back death certificates to those who sign them when such certificates are obscure. The use of the term "puerperal" as covering events that happen during pregnancy, labour, and the puerperium, is to my mind unnecessarily confusing. Puerperal hæmorrhage may possibly cover post-partum hæmorrhage, but why should it include accidental and unavoidable hæmorrhage also? Moreover, why should not the three forms of hæmorrhage be classified separately. Again, puerperal convulsions and albuminuria are vague terms covering the effects of a primary hepatic condition as in eclampsia, and also chronic Bright's disease. Still, whatever may be the deficiencies, real or imaginary, of official terminology, the fact remains that sepsis, and then eclampsia, ante- and post-partum hæmorrhage, the other accidents of labour and pregnancy, and pulmonary embolus are the most common causes of maternal deaths.

I come back to my classification of "personal" and "impersonal" causes, and I want to suggest that the official list of deaths shows that all the most common causes of maternal mortality are, or can be made, "personal" causes, and as such can be removed. I will consider them one by one, and sepsis comes first.

I think I may take it as almost certain that, if a healthy woman, who has had a normal pregnancy and in whom the essentials for a normal labour, such as a vertex presentation, etc., are present, has her baby without any assistance whatever on the top of a mountain away from most of the apparatus of civilisation, she will not get sepsis. She will do her personal washing in a nearby pool, or spring, or stream, but she will not have hip baths. There will be no examinations or interference of any kind. She will bear her child in the squatting position, and she will expel the placenta in a similar manner. She will then lie down, and in a little while get up and make herself a cup of tea. Her whole posture during labour causes a flow from the uterus to the vagina and thence externally. There is no opportunity for its reversal, and the aspiration of fluids from the vulva into the vagina, as is so liable to happen under ordinary conditions, cannot occur. Each time she gets up after labour the vagina empties, and each time she suckles her infant uterine contractions expel what little lochia may have collected in the uterus.

Compare this with the history of her sister, an equally normal woman. She enters a nursing home for her confinement, and begins her opportunities of infection by sitting in water in a bath which has just been used by another patient. Her vaginal orifice is somewhat patulous and water enters freely. She is then examined vaginally to see that all is normal, and later perhaps a second or third time to see if the doctor must be sent for. She has been

sent to bed early in the first stage, and her position and mental anxiety make labour tedious. The nurse thinks it is getting too slow, so she presses on the fundus to try to hasten the expulsion of the child. The uterus is pressed down into the pelvis, and, when the pressure is relaxed, it rises again and there is some vaginal aspiration, which sucks into the vagina any fluid lying near the orifice. Such fluid has been infected by an unsterilised "wipe," and so more bacteria gain entrance.

The first stage continues, the patient is crying from nervousness and unrelieved pain, and so the medical attendant is summoned. He examines again and finds nothing wrong, so he is wise enough to give her a sedative and to wait. The moment, however, she comes into the second stage the forceps are applied. In a way she is a lucky woman, because it might have been applied during the first stage.

During the third stage there is more vaginal aspiration, and more fluid sucked back. The placenta is retained in the upper part of the vagina, and is removed manually. The patient shows signs of acute sepsis thirty-six hours later, and dies within three days.

Was the cause of her death "personal" or "impersonal"? Civilisation forced her to have her baby in an abnormal attitude, and in the confined circumstances of a nursing home, instead of in a normal attitude in an open space, her nurse sent her to bed when nature wanted her to walk about, her doctor extracted her baby with forceps when she would have done it herself if she had been

allowed. Lastly, he extracted the placenta when nature would have expelled it if the patient's attitude had not prevented her. Then civilisation again made her lie on her back or side in bed, while the normal discharges of the puerperium collected in the upper part of the vagina, and the septic organisms which had entered found both a medium in which to develop and an incubator to help development.

It is obvious that the cause of her death was "personal," and it is equally obvious that it could have been prevented by a radical alteration in the whole conduct of labour as at present carried out. I think we are beginning to know enough to make such an alteration. A generation ago we should not have done so, and the cause of the woman's death would rightly have been termed "impersonal."

There have been various ill-judged attempts to suggest that the graver forms of septic infection can and frequently do result from causes which are, even theoretically, beyond personal control, that is, that they are due to "impersonal" causes, as I have called them. It has been suggested that a small local infection—an alveolar abscess, for example—can become generalised during the puerperium and cause a fatal sepsis. Of course it can become generalised, but what reason have we to think that there is any recognisable tendency for it to do so during the puerperium? If there is any special tendency, then I suppose the probability of its doing so can be reckoned in fractions of a millionth. To regard it as a possible cause of infection in any given case is to exaggerate with the infinitesimal.

On the other hand, it is quite possible that the alveolar infection may pass to the patient's skin, thence to the nurse's skin, thence to a "wipe," and thence to the mucus on the vulva which may subsequently be pushed or sucked into the vagina.

The difference between the two methods of infection is that the former is due to an "impersonal" cause which it is almost impossible to combat; the patient may not even know that the abscess exists, while the latter is "personal" and can be prevented.

Again, it has been suggested (Bonney) that, because the use of rubber gloves during labour has not been followed by the improvement which has resulted from the use of rubber gloves in surgery, there is some factor other than the introduction of organisms from without that ordinarily causes sepsis. The originator of the theory looks round for the culprit and finds one in the contents of the rectum. Now, putting aside the fact that in Holland, where the septic mortality rate is one-half that of the British Isles, the women have also rectums and rectal contents, is there nothing in the history I have outlined above that suggests ample possibilities of infection, even if the nurse and the doctor changed their gloves every five minutes? Moreover, is there not ample opportunity even if the child and the placenta had been expelled by the natural efforts, and even if all vaginal examinations had been omitted? I think there is. I think that septic bath water can get into the vagina during an immersion bath, and I think that the infection can be

provided by the patient herself, or by the other patients in hospital. I think that septic fluids can be aspirated into the vagina during labour and that the infection can come, *inter alia*, from unsterilised "wipes," or bedclothes, or nightgowns. I do not think it is necessary to look to rectal contents, which have been a possible, but harmless, factor long before sepsis assumed its present importance. Moreover, I find it very difficult to attach responsibility to what is actually part of the normal working of the body, when there are plenty of other factors to be found in the abnormal complications of civilisation.

Besides what I may call the heresy of Dr. Bonney, there is another belief that finds considerably more support. It is to the effect that, in the vagina of the apparently healthy woman, virulent streptococci may exist which are capable of causing a fatal septicæmia after labour. This belief may, I think, be called the "cocoa theory," because it is "grateful and comforting," and serves to explain all manner of cases for which an obvious reason does not at once present itself. The fact remains, however, that, so far, there is no proof that such a condition occurs as virulent streptococci lying dormant in an apparently healthy vagina. Consequently, to adopt the idea, in order to account for any considerable proportion of cases of fatal sepsis is to my mind absurd. Moreover, even assuming its possible truth, it in no way affects the necessity for a rigorous asepsis in labour. Even those who are inclined to swallow it will hardly be ready to believe that it accounts for the majority of infections, and so, if

we are to prevent the exogenous cases, asepsis must still be positive.

It is impossible to enter here into a prolonged discussion on the ætiology of septic infection. I have adopted the views which seem most probable, and I have based my suggested remedies on them. Even if these views are subsequently found to be incorrect, I think they are, in the present state of our knowledge, expedient. It seems to me that, for the prevention of an evil, it is better to trust to known remedies which have proved effective under other circumstances than to sit down and blame Providence for turning a physiological process in a healthy woman into a death trap.

I have devoted space to these views because, if they are accepted, it makes the cause of septic deaths an "impersonal" one, which is almost incapable of remedy. On the other hand, I submit that in the vast majority of cases the cause is "personal," and can be removed so soon as we are prepared to carry our existing knowledge to *all* its logical conclusions.

Eclampsia and the other toxæmic conditions of pregnancy come next in the list of death causing factors, which, even under present conditions, can be definitely regarded as almost universally due to "personal" causes. A pregnancy, during which the safety of the patient is duly guarded by advice and care, is almost invariably free from such complications provided the patient and her friends accept the advice and act upon it.

I have found it difficult to obtain any large

volume of statistics to show the relative mortality from eclampsia and toxæmia amongst patients who have, or have not had, ante-natal care. The largest I can get are those of the Queen Victoria Jubilee Institute, the greater number of the patients of which receive constant ante-natal care and supervision, and those of New Zealand, in which I am afraid the greater number do not.

In 1924 and 1925 103,754 patients were confined under the care of the Institute's nurses. There were 18 deaths from eclampsia, which, I take it, also includes toxæmia without convulsions—a rate of 0·17 per 1,000.

In New Zealand during the six years ending 1927 there were 169,494 births. There were 195 deaths from eclampsia and toxæmia—a rate of 1·15 per 1,000, or almost seven times the rate amongst the patients of the Institute.

Here are some further statistics relating to smaller numbers of women :—

Dr. D. W. Roy, who represented the Royal College of Surgeons of England at a Conference on Maternal Morbidity and Mortality, called on the initiative of the British Medical Association in February, 1928, gives the following statistics “ of the work of a hospital ante-natal service ” : In the period 1904–1909, when ante-natal work was not so systematised as it became later, 16,565 patients were confined. There were ten deaths from eclampsia. In the period 1922–1926, when ante-natal care was well organised, 13,067 patients were confined, and there was one death from eclampsia.

In the Dudley Road Infirmary Maternity Home, Birmingham, in 1925 there were 1,217 confinements. Amongst the patients who had had ante-natal care there were no cases of eclampsia, amongst those who had not had such care there were nine cases with one death. In the following year there were again no cases in the former group, while in the latter there were six cases but no deaths.

At the East End Maternity Hospital in 1926 and 1927 4,173 patients were confined. The attendances at the ante-natal clinic numbered 11,881. There was not a single case of eclampsia.

Lastly, the investigations of the Eclampsia Committee of the Royal Society of Medicine have shown that the number of cases in which eclampsia comes "as a bolt from the blue" without any warning signs is very small.

I think, then, that we may safely consider that eclampsia and the allied toxæmias of pregnancy are due to a "personal" as distinct from an "impersonal" cause. Further, that the necessary "personal" factor is to be found either in the patient and her friends, who refuse guidance and care, or in the medical attendant or midwife who neglected to give it.

The hæmorrhages of pregnancy and labour come next in importance, and here I am afraid we shall find that, while in most instances death from these complications is the result of a "personal" cause, it is often the result of an impersonal one.

Death from unavoidable hæmorrhage is usually due to a "personal" cause, because as a rule

efficient ante-natal care enables the existence of a placenta prævia to be recognised, and the condition treated under the most favourable circumstances. Even after severe hæmorrhage has occurred death is often more the result of unsuitable treatment than of some purely "impersonal" cause.

With accidental hæmorrhage the condition is different. I do not know that there is any means of foreseeing those cases which start with a violent hæmorrhage, or any means of preventing their occurrence. If we accept the view that every case of accidental hæmorrhage is due to a toxæmia, then by the prevention of toxæmias it ought to be possible to avoid the hæmorrhage. I doubt, however, if it is possible to accept this view in every case. Concealed accidental hæmorrhage in its severe form depends on some factor that affects the normal tone of the uterine muscle. It is very probable that this factor is toxæmic in origin. If so, it is due to a "personal" cause that theoretically can be prevented. The more common external accidental hæmorrhage is another matter, and its connection with puerperal toxæmia is less evident. Still, even here the adoption of suitable treatment for chronic nephritis, syphilis, and such other possible causes as may be determined may eventually lessen materially its frequency. For the present, however, I am afraid we must regard it as often due to "impersonal," and so unpreventable, causes. When it does occur, however, its results largely depend on a "personal" cause, that is to say, on its treatment. As in un-

avoidable hæmorrhage, a large proportion of the resultant mortality has been due to improper treatment, and notably to the adoption of *accouchement forcé*, a procedure which, no matter what its condemnation by obstetrical authorities, is still always with us. Cæsarean section, too, in cases in which severe bleeding has already occurred, helps to add to the mortality list.

Deaths from post-partum hæmorrhage, on the other hand, are almost invariably due to a "personal" cause, with the exception of those rare cases which are of a sudden and violent type, and for which it is difficult to find a satisfactory explanation. In the majority of cases bleeding is due to one of two causes—incorrect management of the third stage of labour, trauma, or abnormal placental adhesion, and the first two of these are obviously "personal" in origin. Moreover, the failure of treatment to save life is very often due to the common human failing of unpreparedness.

I think, then, that I may sum up the position in regard to the hæmorrhages of pregnancy and labour by saying that, while a certain proportion of the deaths resulting from them are, so far as our present knowledge tells us, due to "impersonal" causes, the majority are due to "personal" causes, and so are preventable.

Deaths from the accidents of labour, including difficult and obstructed labours, are almost wholly due to "personal" causes, and so are generally preventable by efficient ante-natal care and diagnosis and by greater knowledge and experience. There

are undoubtedly exceptions, such, for example, as deaths from spontaneous rupture of a uterus early in labour due to muscular changes which could not be foreseen. On the other hand, almost *all* deaths from difficult or obstructed labour are due to personal causes, because efficient ante-natal care and diagnosis and greater knowledge can prevent them. Sometimes the treatment of the case is simple, and can be carried out early in labour, as in transverse presentation. At other times diagnosis is more difficult, and it is only possible to recognise the presence of an obstacle after the symptoms of delayed labour have appeared. Amongst such cases are certain forms of foetal deformity and perhaps maternal tumours.

Apart from these, however, there are few forms of obstetrical complications in which the results of obstetrical prophylaxis are so striking as in the case of mechanical obstacles to delivery. A few movements of the practitioner's hands on the abdominal wall at the correct time, the application of a couple of pads and a binder, and a condition which, if untreated, must cause maternal and foetal death, is turned into a normal labour. A careful examination, internal and external, the recognition of a small fibroid that prevents the descent of the foetal head, its prompt and correct treatment, and, again, the saving of two lives. In contracted pelvis it is the same thing. In foetal hydrocephalus the scalp is punctured through a fontanelle, and the life of the mother is saved.

If Professor Walthard's views are to be accepted

(*v.* page 188), pulmonary embolus is also usually the result of a personal cause and can be prevented.

In concluding my remarks on the causes of maternal mortality I want again to emphasise the fact that the practitioner can only justify the increased risk he brings to normal cases by the certainty of the relief which he brings to the abnormal ones. If, through imperfect diagnosis, late arrival at the labour, or want of knowledge, he fails to bring such relief to those who want it, it is only right that, by his absence in normal cases, he should also fail to bring danger to those for whom his services are not essential.

THE PREVENTION OF MATERNAL MORTALITY

Before I begin to discuss the prevention of maternal mortality, it is necessary to decide whether such discussion is to be based on the persistence of all the ordinary routine and custom of the present, or whether it is permissible to assume a state of affairs in which the latter are radically changed.

So far throughout this book I have assumed that present conditions are more or less permanent, that women will go more and more to nursing homes and hospitals, that medical practitioners will attend normal cases (though this I have to some extent questioned), and that the modern bad fashion whereby women are confined in bed will be continued. If I could assume the alteration or the abolition of these things I think I could almost promise a reduction of the rate of maternal mortality to a quarter of its present figure. But what good would it be if

such radical changes are universally regarded as impracticable?

On the other hand, I think I would like to put my opinion on record, because I believe that I am foreshadowing what will eventually happen. I really think that it is only tradition and custom which make women content to be confined in bed under the care of a doctor in a hurry, and that once the importance of a change is realised it will come very rapidly. After all I doubt if it would seem to the feminine mind to be a more radical change than was that from crinolines to modern skirts. The latter change has increased feminine health and happiness, and the former, if it was given the chance, would very possibly do the same.

I therefore propose, firstly, to recapitulate the measures necessary materially to reduce maternal mortality assuming the conduct of midwifery to remain much as it is, except for the management of normal cases by midwives, and then I will indulge my desire to speculate on the events of the future.

I have tried in previous chapters to show that the direction in which we must look, under present conditions, for the reduction of maternal mortality are as follows :—

- (1) Efficient medical education in obstetrics.
- (2) Efficient training of midwives and maternity nurses.
- (3) The improvement of maternity hospitals both public and private.
- (4) The general recognition of the facts that labour must be carried out under aseptic conditions, and

that it is not permissible to interfere with normal labour.

(5) Ante-natal supervision and care.

It is unnecessary to labour these points again at any length. They are fairly generally recognised, though they are still far from being accomplished facts.

It is generally recognised that the obstetrical education of the medical student is insufficient, and that maternal mortality is higher than in countries where he is better trained.

It is generally recognised that the education of midwives is insufficient, and that maternal mortality is higher than in countries where they are better trained.

The shortcomings of maternity hospitals are so obvious, and their connection with maternal mortality so clear, that public recognition of the fact is eventually certain.

The necessity for asepsis in midwifery and for efficient ante-natal care is rapidly being accepted in theory. It is mainly only economic and working difficulties which stand in the way of their adoption in practice.

The impropriety of interference with normal labour is also receiving such general recognition that medical opinion will soon compel such interference to cease.

There is a temporary measure which has been adopted for the last couple of years in New Zealand, and which, in a modified form, has recently come into force in Great Britain. In the former country,

it consists of an enquiry into such abnormal or unusual obstetrical cases as suggest that either patient or medical practitioner may benefit by expert advice or criticism, and into such maternal deaths as can be traced. Its prime object is to give to the practitioner concerned such helpful advice or criticism as may be of use to him later in similar cases.

In Great Britain, it consists of an enquiry into maternal deaths only, apparently with the object of obtaining a large amount of detailed information regarding such deaths for the use of the special Committee on Maternal Mortality set up by the Ministry of Health.

I will consider each system separately.

The New Zealand system has been of gradual growth. There are certain forms which come to me monthly or at more frequent intervals for inspection. These are :—

(a) The monthly returns of all public or private maternity hospitals in which roughly four-sevenths of the total births of the country occur.

(b) Eclampsia notification returns.

(c) Returns from the medical superintendents of general hospitals regarding all maternity cases admitted in any stage of pregnancy, labour, or the puerperium.

From these returns it is possible to trace a very considerable proportion of the maternal abnormalities or mortalities that have occurred during the previous month. If a case occurs which suggests that enquiry may produce a clue to the standard of

able to let me have as full a report on this case as is possible.

“ I am, etc.”

After this enquiry had been going on for some time with apparent success, I learnt that in one part of the country, where its object was not properly understood, exception had been taken to it on the ground that it constituted an unwarrantable interference by the Health Department with the rights of private practice. Accordingly, once more to make the position clear, the following extracts appeared in a paper by me on obstetrical matters generally in the *New Zealand Medical Journal* (July, 1928) :—

“ For the last eighteen months or so I have tried to carry out a kind of informal enquiry into the treatment of certain complications of pregnancy and labour, and, to a less extent, into maternal deaths. I wish to make it quite clear that this enquiry was originated by myself, and is not a matter of departmental policy, and that, while I have tried to make it to the advantage of medical practitioners to give the Medical Officers of Health the information they seek, there is no compulsion to do so. My primary object in originating it was that I believed medical practitioners generally would welcome any suggestions which would help to lessen, and eventually to stop, the adoption of practices which were not in accordance with modern teaching, or which would in any way tend to reduce the present rate of maternal mortality.

“ Probably most of my suggestions have referred

to such subjects as the proper management of contracted pelvis, of eclampsia, of the hæmorrhages of pregnancy and labour, and of the different forms of obstructed labour. It is far too soon to know if these suggestions have borne any fruit. In some respects they may have. I have not heard recently of Cæsarean section being done as an alternative to version in transverse presentation, of women being moved from one hospital to another to be treated for post-partum hæmorrhage, or of *accouchement forcé* being so generally accepted as a remedy for a number of difficult conditions. On the other hand, the treatment of contracted pelvis, *from the point of view of subsequent pregnancies*, does not seem to have been materially improved.

“ The investigation of maternal deaths has not been so full as I would have liked, a fact which is due, not to the refusal of practitioners to give information regarding them, but to the difficulty of tracing them. The mortality that occurs *in* maternity hospitals is very small, and so far it has not always been possible to trace transferred patients. Now, however, the different hospital superintendents have very kindly undertaken to provide particulars of all patients coming under their care during pregnancy and labour. In this way it may be possible to trace maternal deaths which would not otherwise have been noticed.

“ So far so good. On the other hand, I understand that, in one part of the country at all events, considerable resentment is felt at what is considered to be an unjustifiable interference by the Health

Department in the work of medical practitioners. I hope I have made it plain, firstly, that there has been no interference, and secondly that the enquiries to which I have alluded are a personal matter of my own as distinct from a definite policy established by the Department.

“ There are two points I should like to make clear. The first is that my enquiry is confidential, that often I do not even know the name of the practitioner concerned, and that there is no question of any censure, expressed or understood, even though the particular case might warrant it. So definite is this that if I happened to learn by any other means the particulars of a case which suggested malpraxis, I should refuse to enquire into it, and leave it to be dealt with by others.

“ The second point is that my criticisms are in no way affected by the professional status of the practitioner concerned. If I criticise at all, I shall criticise each case on what appears to me to be its merits. As a matter of fact I have had occasion to take considerable exception to practices adopted by prominent surgeons, and to criticise them as freely as if they had been junior practitioners. The reason for this is obvious. The skilled general surgeon approaches a midwifery case with an absence of all special knowledge of midwifery. He would be the first to admit it. Surgery is his legitimate profession, and in midwifery it has to be his panacea. Confronted with obstetrical complications, he realises that Cæsarean section is the only means he possesses of treating it. The obstetrician, on

the other hand, recognises that his duty is to adopt obstetrical measures and to avoid operations if he can. It is therefore not strange that the general surgeon comes in for possibly a greater proportion of criticism than does the general practitioner."

At the present time enquiries are going on most satisfactorily, and although occasionally a practitioner replies to the initial letter of the Medical Officer of Health that he has no intention of discussing his private practice with the Health Department or myself, such cases are extremely rare. On the other hand, a number of practitioners write spontaneously to ask for criticisms of, or suggestions on, cases they have had.

The English system is a more formal one, and differs, so far as I understand it, in many respects from the system I have described. Its general tenor may be gathered from the "explanatory note" which has been issued on the subject. I take from this note the following extracts:—

(1) "In accordance with the directions of the Minister of Health, the Committee on Maternal Mortality have drawn up an Enquiry Form for the investigation of maternal deaths. . . . Obviously it will be convenient if the data relating to these deaths are collected in a generally uniform manner, and it is, therefore, hoped that similar arrangements will be made in all parts of the country."

(2) "In order to prevent misconception, it is desirable to state in the first place that all information given on the Enquiry Form will be treated as *strictly confidential*. It will be available only to the

Medical Officer of Health himself and to the Ministry of Health, for public health and scientific purposes. Should it be expedient to utilise information obtained in this way for purposes of a report, all names of persons, places, institutions, etc., which might lead to identification will be omitted."

(3) "The Medical Officer of Health concerned, who should be the Medical Officer of Health of either the Local Supervising Authority, or the maternity and child welfare authority, and should not be engaged in private practice, will be responsible for the enquiry which, so far as medical data are concerned, should be conducted by himself, either alone or with the assistance of some competent registered medical practitioner. In areas where no recognised obstetric specialist is available to assist the Medical Officer in such enquiries, it may be desirable to invite the local division of the British Medical Association to nominate one or more practitioners whose service could be requested as and when necessary. The enquiry should always be carried out with the co-operation of the medical practitioner in attendance on the case, and it is perhaps hardly necessary to emphasise the importance of observing the rules of professional courtesy in letter and in spirit. The names of patients or their doctors need not necessarily be included in the reports as submitted to the Ministry, numbers or initials being substituted if preferred."

(4) "Much of the information asked for on page 1 of the form will be available already from various sources, and the remainder will usually be obtained

at an interview between the general practitioner and the medical investigator. In making such further enquiries as are necessary, due care should be taken to avoid any appearance of criticism of those concerned in the professional conduct of the case. If it be remembered how disturbing to the practitioner is a maternal death in his practice, it will be realised that the attitude should be sympathetic rather than critical."

The "Enquiry Form" referred to is a printed document of four pages with space for all information pertinent to the case. It appears to be admirably suited to its purpose.

It will be noted that in the "Explanatory Note" it is stated that "due care should be taken to avoid any appearance of criticism of those concerned in the professional conduct of the case." If this sentence means literally what it says, then it is a very proper direction. If, however, it means that no criticism is to be made of the *conduct* of the case, then I submit that the investigation misses what ought to be its most important objective.

Criticism is essential—not hostile criticism or criticism of persons, but, when necessary, criticism of methods. What conceivable benefit could a discussion at a medical society bring to any one if criticism of the views and acts of his *confrères* was forbidden? Let us suppose that Dr. "A" has lost a case of obstructed labour through failure to observe the initial symptoms that pointed to the possibility of obstruction. What possible benefit is it to him or to his future patients that the anonymous records

of his case are stored at Whitehall, while he himself honestly thinks that the principles of his treatment were correct ?

The British Medical Association seems to have recognised the truth of this view. The special Committee on Maternal Morbidity and Mortality reported as follows on the subject :—

“ The Ministry of Health is pressing upon the local authorities the necessity for an investigation in every area, by a competent and experienced medical officer, of all maternal deaths and all cases of puerperal fever. . . . The Council, on being asked for its support, agreed that such an investigation would be useful, if carefully controlled by a competent and experienced medical officer and if the results were used exclusively for scientific and public health purposes, and urged that it was most important that, where necessary, such an investigation should be followed by the offer of expert advice and assistance, institutional or otherwise.”

This is the system we have deliberately adopted here, and I very much hope that the consistent support of the medical profession will make it unnecessary to change it for one which is more formal and less—may I say—critical.

I have referred to these investigations as “ a temporary measure ” in the campaign against maternal mortality, and I have called it temporary, because improved medical and nursing education, ante-natal care and asepsis will remove, when they have been carried out in practice, the necessity for

expedients which, unfortunately, at the present time seem to be temporarily essential. Medical education has been, and is, insufficient, and guidance in obstetrical matters is wanted until the results of improvement are obvious.

I think that in conclusion I will venture to elaborate a scheme for the management of the pregnant and parturient woman, and that in so doing I will not regard myself as bound by any limitations of custom, or tradition, or professional interest, the sole determining factor being the welfare of the patient and her infant.

It will be seen that the system I suggest very closely resembles that which is followed in Holland (*v.* Chapter II.).

Every woman has, or ought to have, a family physician, whose duty is as much to keep her in good health as to cure her when she is ill. Seeing that prophylaxis is the greater part of midwifery, her plain duty is to report to this practitioner as soon as pregnancy declares itself. He examines her thoroughly along the lines already suggested (*v.* Chapter VI.). If he finds everything normal there is little more for him to do at that time. If he finds evidence of present or future complications, his course is as has been already laid down. If he finds either now, or on any subsequent occasion, that difficulties present themselves, either in the way of exact diagnosis or in deciding on the treatment suitable, he should send his patient to an obstetrical specialist. The practitioner who deliberately

refrains from such a course when it is indicated is not discharging his duty to his patient.

I am not concerned now with the further history of abnormal cases. I will return to this later.

The preliminary medical examination of the patient over, she passes automatically under the care of the midwife who has been selected to look after her, and whom she at once engages. This midwife is responsible for her care during pregnancy, so long as her condition remains normal, for the carrying out of any medical instructions and for seeing that she visits her family physician in accordance with the directions she has received or should any abnormality arise.

The necessary "care" of the normal patient consists, in the main, of instruction in all matters concerning pregnancy and labour, in the relief of the minor ailments of pregnancy, in the routine examination of the urine, and, in the later months, in abdominal palpation and diagnosis of the probable coming course of labour. In this manner we ensure that in the vast majority of cases a normal patient arrives at the end of pregnancy ready to begin a normal labour. Before the latter begins, however, it is advisable in all cases and essential in the case of primiparæ, that another visit should be paid to the family physician for a final decision that so far there is no abnormality present. This visit should take place as near the assumed date of labour as is possible.

The normal patient remains under the care of the midwife during labour, thus ensuring the absence

of any element of haste, and of one possible element of infection.

Labour is conducted along approved aseptic lines. Vaginal examination is unnecessary except in the multipara, in whom it may be wise to make an examination after the membranes have ruptured, lest prolapse of the cord or any alteration in the presentation may have occurred. It is possible that this examination may be satisfactorily made by the rectum instead of by the vagina.

The patient is allowed and encouraged to remain out of bed during the first stage of labour, and to walk about, sit, or lie down at intervals. If she is a very nervous woman, if the pain of the contractions is severe, or if the first stage is prolonged and she wants sleep, the midwife may be allowed to give suitable doses of an approved sedative.

All such obstacles as a loaded rectum or a distended bladder are carefully avoided, and an abdominal binder corrects any tendency to obliquity of the uterus, or to a pendulous abdomen.

As the end of the first stage approaches, the patient both of her own wish, and possibly as a precautionary measure, goes to bed. She is provided there with a firm support for her feet against which she can push, and with a cord attached to the end of the bed on which she can pull. She is thus able to use her voluntary efforts at expulsion to the full, as opposed to the woman who lies in a large bed, with nothing against which to press her feet, and probably nothing on which to pull.

As the contractions get stronger and the pains

greater, she is given Murphy's inhaler with a little chloroform in it, and as she has been already taught how to use it and knows that it will relieve her, she takes it eagerly, breathes through it at the proper time, and as she gets semi-unconscious drops it, to pick it up again with the next pain.

The baby, in accordance with accepted *modern* practice, is born with the patient lying on her left side.

After the birth of the baby she is turned on to her back in order that gravitation may tend to pull the uterus into the pelvis, and so keep up a positive pressure in the vagina. If the patient is allowed to remain on her left side gravitation makes the uterus fall towards that side and drags the vagina slightly upwards, thus causing a negative pressure in the latter and so a tendency to aspirate into it fluids from the region of the vulva. The placenta is then expressed as soon as it comes into the vagina.

The labour over, and the patient recovered from its immediate effects, her care during the puerperium may be handed over to the maternity nurse, if the time of the midwife is too valuable to allow her to undertake it. During this time the maternity nurse should work under the supervision of the family physician, and, if this is not possible, the midwife should occasionally visit the patient to see that all is going well.

The general management of the patient should be conducted on rational lines. The care of the necessities and functions of the body, free movement and exercise while in bed, early getting out of bed

for short intervals, plenty of rest and sleep at other times are, amongst other things, the fundamentals of a well-managed puerperium.

Finally, the necessary post-natal examination is made by the family physician, the position of the uterus determined and if necessary rectified, and the presence or absence of any other important consequences of labour noted for future care.

I have already hinted that I am very much inclined to think that the accepted modern practice, whereby a patient is confined lying on her left side, is wrong. At the same time I recognise that, in common with everyone else, I have no practical experience to guide me. I think, however, that the woman will deliver herself with less effort when she assumes the squatting position during the second and third stages of labour than when she is lying on her side in bed.

My reasons for so thinking are partly taken from the analogy of defæcation, and are partly due to the belief that the squatting position was probably adopted for more thousands of years in the world's history than delivery in bed has been adopted for tens of years.

It is common knowledge that the proper emptying of the rectum is prevented, and constipation encouraged by the habitual use of a closet seat so high that the feet cannot press firmly against the floor. Much chronic constipation is due to such a cause, especially when the practice has started in childhood. The emptying of the rectum is partly due to muscular contraction of the walls of the rectum, and partly

to a general increase in the intra-abdominal pressure—the result of a voluntary bearing-down effort. This effort fails to a great extent when the feet are hanging loosely off the ground, and is most effective when the person is in a squatting position. Our ancestors a few generations ago invariably adopted the squatting position. When earth closets were introduced, it was common to have several, with the seat of each fixed at a different height to suit the varying size of the members of the family. Then the water-closet was introduced. It was impossible to have a number of pedestals side by side to suit different ages, and constipation began. In other words, the squatting position took the place of, or rather rendered unnecessary, the fashionable laxative of the present time.

I submit that in midwifery the conditions surrounding the expulsion of the child are very similar. The emptying of the uterus is due partly to the contractions of the muscular coat of the uterus, and partly to a general increase of the intra-abdominal pressure—the result of a voluntary bearing-down effort. This effort fails to a great extent when the feet are lying loosely in bed without anything against which they can push, and is—in my opinion—likely to be most effective when the woman is in a squatting position.

Moreover, gravitation must be of considerable help. It is sometimes customary, when slow delivery is desired after podalic version, and the patient is not in labour, to apply a gently tractive force to the leg, and this force is often produced by

a weight of a couple of pounds pulling over a pulley at the end of the bed. It effects the object. The normal child weighs about seven pounds, and when this weight is acting almost directly in the axis along which the child is travelling it must produce a noticeable effect. When, on the other hand, the woman is lying in bed, the child's weight passes to the spinal column or the lateral abdominal wall, and so from a practical point of view is lost.

There is another point to consider—namely, the effect of the squatting position on the relation of the innominate bones to the sacrum. When a patient is placed in Walcher's position with the legs hanging down unsupported, the weight of the latter causes a downward rotation of the innominate bones round the sacro-iliac joints, and the length of the true conjugate is increased, while the length of the antero-posterior diameter of the outlet is lessened. When the patient is in the squatting position, it is probable that the reverse happens, and that the bones rotate upwards, with consequent shortening of the true conjugate and lengthening of the antero-posterior diameter of the outlet. If this is so, it suggests, firstly, that the patient should not assume the squatting position until the greatest presenting diameter has passed the brim, and, secondly, that such position directly facilitates the passage of the head through the outlet.

Just as the squatting position was used for defæcation, so our ancestors also adopted it in childbirth. Then as civilisation increased, and the first feminine demand for assistance was made, the patient sat

either on some one's knees, perhaps those of the midwife, perhaps those of her husband, or on the delivering chair. Then a demand for greater comfort came and the patient was put to bed. At first, as in the case of the closet seats of different heights, care was taken that the feet had a support, and that she had a means of straining against it. Then such essentials were forgotten. In consequence the length of labour increased, and another urgent feminine demand for assistance arose, with the result that even the medical practitioner who was not in a hurry was driven to the excessive use of the forceps. This is the demand of the moment. In a little, however, the necessity for and the method of using bearing-down efforts will be wholly forgotten, and there will come another demand for universal Cæsarean section.

Nowadays no one walks if he can drive. No one uses his own muscles for work that can be done by a machine. Why then should a woman labour to produce her child when Cæsarean section will produce it without a maternal effort?

Such reasoning is obviously too illogical to need consideration; still, illogicality has never prevented people from running after a popular fancy. The remedy lies in the hands of the medical profession, by whom the public as a whole will usually be guided. If this guidance could take the form of urging a turning back to the simpler methods of the past, of encouraging the normal, and of emphasising the dangers of avoidable interference, unnecessary maternal mortality would largely disappear. The

adoption of a rational posture during labour is, I think, one of the important retrogressions which are likely to help in such reduction.

The squatting position during the third stage of labour is as valuable as during the second stage. In normal labour, as carried out with the patient lying down in bed, the mechanism of placental expulsion invariably breaks down. The placenta is detached by uterine retraction. It is expelled into the vagina by uterine contraction. There, it tends to remain. Uterine contractions no longer affect it. The stretched and relaxed abdominal muscles cannot exert the necessary force to drive it down. Consequently, unless assistance is given, it tends to remain for hours in the vagina, until eventually it is expelled by the repeated downward pressure caused by the patient's movements, coughing, or any other form of straining.

The practices adopted long ago to expel the placenta, and still followed by primitive races, are interesting and intelligible. Further, they are very much safer than such more modern and civilised practices as traction on the cord or manual removal. The most common of them were the giving of some nauseating drink that caused vomiting, or of some kind of snuff that caused sneezing. In other cases the woman pressed a large round stone into her abdomen, at the same time straining downwards. All these were just methods of increasing the intra-abdominal pressure, and when associated with the squatting position, it is probable that they seldom failed. As in the case of the child, gravitation actively helped.

It is one thing to realise that the squatting position is more likely to produce a normal labour than is the recumbent position in bed ; it is another to adopt it in practice. I have suggested that the change is not a more radical one than from crinolines to present fashions ; still, many great-grandmothers would have kept their daughters permanently in bed rather than have allowed them to appear in public clad as are the present generation. Similarly, most women of to-day will refuse, or will induce their daughters to refuse, a radical change in those obstetrical details which they may incorrectly regard as of prehistoric origin.

The mental picture which my suggestions may conjure up to some readers is probably that of a woman squatting in the middle of a large room and of a baby descending on its head into an enamel-iron dish. The picture in my own mind is something quite different. It shows an obstetrical couch, which is slightly longer than usual, say $6\frac{1}{2}$ feet, or possibly 7 feet. It is firmly planked underneath to carry the mattress. It has also a narrow, removable plank across the bottom of the bed, rising some 3 or 4 inches above the level of the "floor" of the latter. An extension upwards of the bottom legs carries a rigid transverse bar, of sufficient diameter and at the correct height to enable it to be gripped firmly and comfortably by the patient's hands, as will be described. The upper two-thirds of the bed is covered by the usual mattress. The lower third is covered by a folded blanket, which in turn is covered by a mackintosh

sheet, which in turn is covered by a sterilised sheet. The mattress is kept from slipping down by a cross piece 2 or 3 inches high, which is continued along each side to meet the bottom cross planks, and which, together with the side and bottom planks, serves to raise the edges of the mackintosh, so as to prevent the escape of blood or liquor amnii.

The patient, suitably clad, lies at first on the upper two-thirds of the bed in the ordinary manner. If additional support is wanted for her feet, a pillow is slipped temporarily beneath the mackintosh covering what I may call the "delivery board." When the expulsive pains begin she is brought on to the latter, where there is no mattress. She sits there on a low stool, about a foot in height, with a sterilised covering, faces the lower end of the bed, and grasps the transverse bar. During a contraction the stool is removed and she squats, still holding the bar. As soon as the contraction is over the stool is replaced.

The baby is born while she is still squatting and is received by the midwife, who stands at the foot of the bed facing the patient.

This done, the patient again sits on the stool, or lies down, and waits until a few uterine contractions have occurred. She then again squats, straining down, and the placenta comes away, helped, if necessary, by the pressure of the midwife's hand on the abdominal wall.

All blood and mess is caught in the dished mackintosh, and removed with little trouble.

If at any time the patient is unable or unwilling to continue to sit and squat alternately, she can be brought back on to the mattress, where she lies in the usual manner.

In considering the above suggestions it must be remembered that they are made without the guidance which practical experience brings. Consequently, it is probable that their details can be so improved that eventually the original suggestions would be no longer recognisable. If my views on the effect of squatting on the descent of the fœtus are possibly right, I think the method is worthy of an exhaustive trial, and I think its adoption would bring marked benefit to the normal patient. Unnecessary forceps application would stop. Prolonged labours, where there was no mechanical cause for them, would be reduced to a minimum. Most important of all, the septic rate would also be materially lowered.

What its effect on perinæal lacerations might be, it is hard to prophesy. If we reason from the fact that squatting is the natural posture during the expulsion of the child, the frequency of lacerations should be lessened. It is altogether unlikely that such a posture would make them more common.

So far my remarks have applied to the prevention of mortality following normal labour. The prevention of mortality following abnormal labour has already been fully discussed. The essential remedies are early diagnosis of the cause of complications, whenever possible careful prophylaxis and skilled treatment. In this way the greater number of

complications can be avoided, and labours, which would otherwise have been difficult and dangerous, replaced by labours that are safe and easy. When it is impossible to avoid complications, their treatment must be prompt and skilled, and when their nature places them beyond the skill or knowledge of the attending practitioner there must be no hesitation in obtaining competent assistance. The present death rate from obstetrical complications is unnecessarily high, and can undoubtedly be very greatly reduced even under present conditions. Some deaths are unavoidable, and will remain so for a very long time. A patient with a contracted pelvis may become septic and die in spite of every careful effort to prevent sepsis. On the other hand, it is quite unnecessary that she should die as a result of neglected diagnosis or of incorrect treatment.

Perhaps I may sum up the position in a few lines.

We can almost abolish the present mortality of normal pregnancy and labour by the removal of removable factors that tend to interfere with the normal course of either, by rigid abstention from unnecessary interference and by asepsis.

We can largely reduce the present mortality of abnormal pregnancy and labour by ante-natal care and diagnosis, prophylaxis, skilled treatment, and, once again, asepsis.

CHAPTER X

THE OPINIONS OF OTHERS

I AM afraid that I must now apologise for the fact that up to this I have approached the problem of how maternal mortality can best be reduced, mainly from my own point of view. Consequently, it will be of interest and value to devote the last chapter of this book to the opinions of others. I think that it will be found that in the main points these opinions are very similar to those I have expressed, although details may vary. I propose to give, as representative of the British Empire, two sets of conclusions taken from Great Britain, and two from Australia, and, finally, to enumerate briefly the various steps that have been actually taken in New Zealand, or are in process of being taken. In this way it will appear how far this country has been able to turn into practice the opinions of others.

In February, 1925, the Council of the British Medical Association set up a special Committee "to consider the report on the Causation of Puerperal Morbidity and Mortality, and on the administrative action, if any, that should be taken in connection with the matter." The final report of this Committee was published during the past year (*Brit. Med. Journ.*, April 28th, 1928, *Supplement*). Amongst

its most important observations and comments are the following :—

(1) “ The view is taken that this extraordinarily responsible and difficult branch of practice is conducted by the profession as a whole conscientiously, carefully, and skilfully up to the limit of the knowledge and facilities available, and that to discredit the whole by reason of the shortcomings of the few must inevitably create resentment amongst the predominant part of the medical profession in whose hands the application of the standard of midwifery practice—whatever in the light of new facts and with administrative aids that may be—must, in large part, remain.”

(2) “ The Council is confident that all branches of the profession concerned with the advance of obstetrics will gladly co-operate with the administrative authorities in devising and applying any agreed scheme to minimise the incidence of the diseases and accidents of childbirth.”

(3) “ The prophylactic measures which are necessary to combat infection may be summarised as follows :—

“ (a) Strict antiseptic or aseptic measures, in order to diminish the risk of conveyance of infection.

“ (b) A minimum of obstetric interference, which is especially dangerous after rupture of the membranes.

“ (c) The intelligent anticipation of complications likely to occur during labour by efficient ante-natal supervision.

“ (d) The efficient treatment of any complication of labour should it arise.”

(4) "A practically unexplored field is the condition of the pregnant woman as contrasted with that of the unimpregnated woman. There are grounds for believing that changes occur in her biochemical and her endocrine conditions, and the results as regards increased or decreased immunity and susceptibility to sepsis seem to afford an important field for research."

(5) "From what has already been said it is clear that ante-natal supervision is a powerful weapon with which to attack the problem. Apart from the education of the public by the doctor and the midwife, in regard to its possibilities further means may be devised for increasing the prevalence of ante-natal supervision."

"In Australia there is a Maternity Allowance Act. This provides for a payment of £5 to a mother on the birth of a child, and in 1926 the Royal Commission on Health of that country recommended the amendment of the Act to provide that application for the allowance should be made at least five months before childbirth: 'No payment to be made unless a medical certificate be produced showing that the mother has had ante-natal supervision.'"

(6) "An important element in the armament for an attack on maternal mortality is an adequate supply of beds for midwifery cases. It is difficult, if not impossible, to obtain a comprehensive analysis of the beds definitely set aside for maternity cases in all parts of the country, but replies by the Association's Divisions to the question, 'How many

maternity beds are there in the area ? ' confirm what is common knowledge, namely, that there are not sufficient beds for midwifery cases evenly distributed throughout the country. Twenty replies out of 118 indicated that there were no beds specially allocated to midwifery in their areas."

(7) " It has already been shown that ante-natal work can do a great deal towards the reduction of morbidity and mortality by the detection and rectification of abnormalities. Its utility might be carried still further by classification of cases into those which are normal and those which are abnormal, allocating the former to the midwife, whose function it is to attend normal cases, and the latter for the supervision of the medical practitioner.

" No such ideal can be accomplished without full and cordial co-operation between doctor and midwife. There is here a field for team work comprising ante-natal examination by the doctor in the patient's home or at the clinic, the confinement being carried out by the doctor or midwife or both with the specialist and bacteriologist available in cases of special difficulty, and, in certain cases, institutional treatment."

(8) " There is need for a great educational campaign throughout the country, in which the Association should take a most important part in consolidating medical opinion and in directing the lines upon which progress may best be made."

(9) " A matter of considerable importance is the shortage of material available for instructional purposes, and it is of the utmost importance that

such material as exists should be turned to the best account. Cases are not only required for instruction of medical students, but also of midwives. It is a well-known fact that large numbers of nurses take the C.M.B. as an additional qualification without any intention of practising midwifery, the result being that a large amount of the available material is wasted. It is possible that a longer and more strenuous course of training for the C.M.B. certificate might deter those who have no intention of practising midwifery from taking the certificate, and the problem is certainly deserving of the close attention of those responsible for the training of both doctors and midwives."

(10) "The Ministry of Health is pressing upon the local authorities the necessity of an investigation in every area by a competent and experienced medical officer of all maternal deaths, and all cases of puerperal fever, with a view to ascertaining more exactly the actual causes which lead to maternal mortality, in order to provide further means of prevention. The Council, on being asked for its support, agreed that such an investigation would be useful if carefully controlled by a competent and experienced medical officer and if the results were used exclusively for scientific and public health purposes, and urged that it was most important that where necessary such an investigation should be followed by the offer of expert advice and assistance, institutional or otherwise. The Council would press on the divisions, and on members of the profession generally, the necessity of giving all the assistance

they can towards making the observations secured by such investigations as accurate and complete as possible under the conditions named."

The report concludes with the following recommendations :—

" (1) That steps should be taken to determine by further experimental research :—

" (a) The factors which constitute and the conditions which vary resistance to disease, particularly as regards pregnancy and the puerperium.

" (b) The best specific prophylactic measure to employ for the prevention of infection by streptococcus pyogenes.

" (c) The length of time required to acquire such immunity and the degree and duration of such immunity.

" (d) The therapeutic value of specific as opposed to antiseptic measures in the treatment of septicæmia caused by streptococcus pyogenes.

" (2) That increased facilities should be provided for training medical students with special reference to ante-natal work.

" (3) That a condition of the payment of maternity benefit under the National Health Insurance Acts should be that the mother has had at least one ante-natal examination by a qualified medical practitioner during her pregnancy.

" (4) That members of the medical profession should be encouraged to keep regular and careful records of their midwifery cases.

" (5) That there is need for further provision of beds specially set aside for maternity cases in institu-

tions. That every maternity home should provide for the complete isolation of septic cases.

“(6) That the Association should consider the allocation of additional grants to promote research into the problems raised in this report, including especially the questions raised in the first recommendation of this report.

“(7) That a committee be set up to formulate measures designed to bring about reduction in puerperal morbidity and mortality rates, to keep in touch with research work and to assist Divisions and Branches of the Association in arranging for education and propaganda with regard to the value of ante-natal service, the method of dealing with confinements, and the post-partum care of the mother and care of the infant.”

Recommendations that have already become effective are as follows : Compulsory notification of puerperal pyrexia. Provision of compensation to midwives who are unable to carry on their work owing to having been in contact with a septic case.

Apart from the more obvious suggestions and remedies on which every one is agreed, I am very glad to find that the committee considers the following matters worthy of notice, and so I presume of adoption : The provision of sufficient maternity beds for the treatment of obstetrical complications as well as for those whose home circumstances are unsuitable. The allocation of normal cases of labour to midwives. The compensation of midwives who are unable to carry on their work owing to contact with a septic case. The investigation of

maternal deaths. I presume the penultimate suggestion also implies the compensation of midwives, who own maternity hospitals, for the enforced closure of the hospital.

I have included the reference to the Australian Maternity Allowance because its ineffectiveness is referred to in Dr. Allan's report, from which I quote later.

Dame Janet Campbell, D.B.E., Senior Medical Officer of Maternity and Child Welfare, Ministry of Health, London, concludes an important work on the "Protection of Motherhood" (Ministry of Health No. 48, London, 1927) with, *inter alia*, the following opinions :—

(1) "The training of the medical student and of the midwife is still not wholly satisfactory, although much improvement has been effected during recent years. The medical student does not yet always receive instruction and practice in accordance with the recommendations of the General Medical Council, while opportunities for post-graduate experience of midwifery are most inadequate.

"Although the period of instruction of the midwife has only recently been considerably lengthened, and the curriculum expanded, it is suggested that the whole question of the training and supply of midwives is in need of reconsideration, particularly from the point of view (a) of securing the best facilities and teaching for the pupil who intends to practise as a midwife after gaining her certificate, and (b) of making the profession of midwifery attractive to the well-educated woman."

(2) " The Maternity Service in the country as a whole needs strengthening and improving. A complete Maternity Service, that is a service which secures to every woman such assistance as is needed to ensure for her a safe journey through pregnancy, a well-conducted labour with a minimum of danger to herself and her child, careful nursing and post-natal supervision, cannot be provided without wise and far-seeing organisation.

" Modification of the present ' maternity benefit ' in such a way as to provide medical and nursing services in addition to a case payment, and the linking up of such services with the Maternity and Child Welfare work of the Local Authority, would appear to be an appropriate way of creating a satisfactory Maternity Service. Such a service might well be based on a scheme for improved domiciliary midwifery in which many normal deliveries and all maternity nursing would be performed by midwives ; but always with the active support of the patient's own doctor, who would be responsible for ante-natal supervision, for the conduct of normal labour, if so desired, for the treatment of any complication arising in the course of pregnancy or childbirth, and the oversight of the lying-in period, together with the care of the infant. Supplementary facilities—including the provision of ante- and post-natal clinics for advice or consultation, the appointment of specialists to act as consultants to the medical practitioner who is attending a complicated confinement or a case of puerperal pyrexia, skilled nursing, and maternity beds for such women as

require them—would be provided by the Local Authority in order that the standard of actual obstetric practice may be raised.”

(3) “ Education of public opinion in the importance of the care of maternity is not an altogether simple matter, as maternal mortality is not a problem which easily lends itself to popular discussion and propaganda. Not only is it a subject which is difficult to present suitably to an unselected mixed audience, but it is important that the pathological aspect of midwifery should not be over-emphasised. Something can be done, however, through the medium of Health or Baby Weeks, and much valuable work might well be carried out by societies and organisations which concern themselves with the welfare of women and girls, as well as through the infant welfare centres which are now to be found in all parts of the country.

(4) “ The reason for dwelling upon the tragedy of an unnecessarily high maternal mortality rate is not for the sake of criticism or censure, but because until it is realised that much of the poignant sorrow and suffering caused by misadventure at the time of child-birth is not inevitable and can be lessened, we shall be slow to find the time, money, effort and goodwill needed to persuade all concerned to combine to overcome the practical difficulties of this problem. A convinced public opinion has magnificent driving force, and without it endeavour is apt to be half-hearted and to faint by the way-side.”

It will be noted that Dame Janet Campbell, too,

refers to the possibility of handing over normal cases of labour to midwives. She also indicates her belief in the necessity for the aid of the specialist in complicated cases. I should like to endorse the fourth paragraph of her summary, as quoted above. Too many practitioners are inclined to resent all organised efforts to lessen mortality because of the censure which they imagine such efforts to imply.

Dr. Marshall Allan, M.C., who was before the war one of my Assistant Masters at the Rotunda Hospital, has recently presented a long report on Maternal Mortality and Morbidity in the State of Victoria, Australia. His report is based on a personal investigation of the conditions present throughout the State, made by him as Director of Obstetrical Research. In the body of his exhaustive and valuable report, he writes as follows :—

(1) “ Those who use forceps as a routine, defend their attitude mainly on three grounds :—(a) That the perinæum is preserved and not damaged, (b) that no increased morbidity results, and (c) that the foetal death rate is unaffected. Others are not so sanguine and admit that any interference, including low forceps, must carry an added risk. This is confirmed by the records of the two intermediate hospitals in Melbourne, as well as by the autopsy results previously quoted.”

(2) “ Whether or not the object of the Maternity Allowance Act was to lessen maternal and infant mortality, it is certain that it has failed to achieve this result. Stress has been laid in this report on the importance of maternal care during the pre-natal

period, the need for improved professional knowledge and better hospital facilities. The use of even a portion of the large sums spent annually on the baby bonus would materially assist these objectives. The recommendation of the Royal Commission on Health, namely, that proof of adequate ante-natal supervision should be furnished before payment of the allowance, has been completely ignored. Maternity benefits form part of the proposed scheme of national insurance, and will be paid in addition to the present allowance. This will afford the Government another opportunity of insisting on proper medical and nursing attention in a suitable environment. There are many problems requiring further research, which cannot be undertaken until funds are available. Therefore it is time that both the politician and the general public realised that continuance of the present scheme does not lead towards any material benefit to the nation."

Dr. Allan's recommendations are as follows :—

"(1) The establishment of a Chair of Obstetrics at the University of Melbourne. More prolonged and intensive training of the student.

"(2) The formation of ante-natal clinics at every centre where facilities exist.

"(3) The erection of modern maternity units, especially in the metropolitan area, to replace the present system of nursing homes.

"(4) Encouragement of trained nurses to undertake obstetric service. Necessary factors in this are the elimination of partially trained and untrained women and the institution of refresher courses and pensions.

“(5) Minimum standards governing the preparations for delivery to be published and enforced both in hospital and private practice.

“(6) Compulsory notification of all cases of puerperal pyrexia.

“(7) Provision of ample facilities for laboratory diagnosis, advice by consultants, and hospital accommodation.

“(8) Death certificates to show the association of pregnancy or child-birth with the cause of death; investigation of all maternal deaths, notification of still-births, legal power for the statistician to obtain additional information from medical practitioners concerning doubtful certificates.”

I have quoted Dr. Allan's reference to the Maternity Allowance because it does not seem to be generally realised that, until a higher standard of medical and nursing education, ante-natal clinics, and all the other urgent services to which I have alluded are established, the giving of a maternity allowance is akin to the giving of chocolates to a woman who wants food. I sincerely hope that other countries will not be led into substituting a luxury for an essential.

My final extract is from an essay by Dr. Sydney Morris, Senior Medical Officer, Department of Public Health, New South Wales, on the causes and prevention of maternal morbidity and mortality (*Med. Journ. of Australia*, September 12th, 1925). It is a valuable essay from which I could with advantage quote much more fully than space will allow me, and so I must confine myself to

taking a few of his observations. He writes as follows :—

(1) “ What public opinion has not yet realised is that the civilised woman requires attention not only at the actual confinement, but also some considerable time antecedent to the latter. Provided that the woman can obtain the services of a competent midwife for the actual confinement and the puerperium, together with the advice and supervision of a careful practitioner during the later months of pregnancy and in any emergency during the actual labour, most other conditions may be considered as relatively unimportant.”

(2) “ When one has had the opportunity of investigating maternal deaths soon after the fatal issue, one cannot escape the conviction that a great many of them could have been avoided by competent attention to the patient, or to her conditions, or to both prior to labour.”

(3) “ Again, the medical practitioner is frequently called in by the midwife owing to some emergency. He knows nothing of the patient or her previous condition, and is compelled to undertake complicated obstetric operations at the last minute and under the most unfavourable conditions. Is it any wonder that such cases form quite a considerable proportion of those which are subsequently complicated by puerperal infection ? ”

(4) “ From this brief survey it will be seen that many factors, economic, political, administrative, enter into the question of the type of professional attendance available to the mother at the time of

child-birth. Many of these difficulties will probably vanish with the lapse of time, but many could be overcome now by a just appreciation of the respective spheres of the midwife and the doctor, together with the necessary steps to control the former on a better basis than has been the case hitherto. In a word, if the confinement be normal, there should be no need, provided the midwife be competent, for the attendance of a medical man; if the confinement deviates the slightest degree from normal, the responsibility of the midwife is to call the medical practitioner. It is a great pity that the maternity bonus is not payable only on the certificate of a medical practitioner to the effect that the mother received adequate ante-natal treatment during her pregnancy. This would mean that those cases showing every indication of normality would be attended by the midwife, with the distinct understanding that the medical practitioner would attend the confinement if necessary, or if special private arrangements were made to that effect. Some such understanding would eliminate a sense of competition between doctor and midwife; the former will have ample opportunity of controlling the situation, for which he should receive adequate remuneration; the latter would have no disinclination to call in the doctor who has already assumed a certain responsibility for the case."

(5) "A statement to the effect that infection may be conveyed through the attendant whether the latter be a medical practitioner or a midwife immediately raises the question of the apportionment of the

respective responsibility. The medical practitioner when associated with a midwife is apt to place the blame on her and to assume an air of righteous indignation, and it has been customary to regard that attitude as quite justifiable. It has previously been pointed out that Australian statistics do not support this contention, and it is hoped that the further facts to be presented here will compel attention to the grave responsibility of the medical profession itself. From the nature of their daily work, who is more apt to carry infection, the one who attends patients with erysipelas, ulcers, suppurating wounds, septic abortions, infected throats and noses, boils, carbuncles and the like, or the one who does not? After carrying out the duties just mentioned, the medical practitioner may be suddenly called to a confinement where there are few, if any, facilities for the effective sterilisation of his hands. The risk could be reduced by means of rubber gloves, but I think it may be reasonably asserted that these are by no means the rule. Who is more apt to expedite the labour by instrumental means, thereby increasing the potentiality of danger—the busy practitioner or the midwife with time to spare? Instrumental delivery involves anæsthesia, which is generally carried out in the absence of skilled assistance. During the operative manipulation the practitioner is frequently called upon to attend to the anæsthetic or some complication, and there is no time for subsequent sterilisation of his hands. Would such a practice be tolerated in any operating theatre? The shade of Lister would be

expected to appear and point an accusing finger. Yet, in dealing with a raw surface greater than any liable to be met with in any branch of operative surgery, the greatest risks are assumed with equanimity. It is peculiar how in a minor surgical operation every care is taken in the preparation of the skin which is closely shaved prior to sterilisation by antiseptics."

(6) "Once it is allowed that forceps can be justified for the sake of expediting delivery either for the benefit of the doctor or to appease the clamour of the mother or her friends, the whole basis of natural midwifery vanishes."

(7) "It is quite unusual for a woman to be thoroughly examined before her return home after the birth of her child. Nevertheless it is very desirable that a thorough pelvic examination be made during the puerperium at some time prior to her return to ordinary life. Avoidance of this duty no doubt results in part from the desire to consider the woman's feelings, but the advantages are quite evident and would convince any lay person. In this way many of the diseases which form so much of the gynæcologist's practice, and which result from the wear and tear of parturition, may be caught in their earliest stages when they are more amenable to treatment."

(8) "Ante-natal supervision will eventually be regarded as the key to success in preventive midwifery; meanwhile it is essential, first, to convince the medical profession, and through the latter the individual mothers, of its indispensable necessity.

Until such supervision is regarded by both doctor and patient as a first principle of midwifery, we shall not be able to bring about the reduction of maternal morbidity and mortality in those directions in which the latter are most preventable."

(9) "Maternal mortality, and especially maternal morbidity, vary in direct proportion to the inefficiency or inadequacy of the professional care and supervision during the ante-natal, natal, and post-natal periods. The midwife's responsibility in the causation of maternal mortality is not as great as is customarily held. The medical profession must, individually and collectively, assume a larger share of such responsibility than has prevailed in the past."

(10) "Artificial abortion probably plays an important part in the production of maternal morbidity and mortality."

With these observations, suggestions, and conclusions before us, it may be of interest to note the steps which have been taken in New Zealand to reduce the present rate of maternal mortality. They are as follows :—

In Relation to Midwifery Nurses.—Two classes of midwifery nurse have been instituted—midwives, and maternity nurses. The period of training has been increased in length, and its standard raised. Compulsory instruction for midwives in ante-natal work has been authorised. Compulsory similar instruction for maternity nurses is in process of arrangement. A uniform system of training, to be carried out in recognised hospitals only, has been instituted. All training schools are inspected

annually. The establishment of post-graduate courses for midwives and maternity nurses is in process of consideration.

In Relation to Medical Students and Practitioners.—Increased funds have been provided for the Obstetrical Department of the Medical School of Otago University. The creation of a professorship in midwifery and gynæcology in the University, the provision of increased facilities for clinical work in midwifery, and the raising of the whole standard of obstetrical education are in process of arrangement. A personal enquiry is carried out by an Officer of the Health Department into maternal deaths, and into cases whose nature suggests the advisableness of enquiry, with personal advice on and criticism of the treatment adopted. The notification of eclampsia has been made compulsory, and also the notification of puerperal fever. The appointment of obstetricians on the honorary staff of certain of the larger general hospitals is in process of arrangement.

In Relation to Maternity Hospitals.—Compulsory registration of all maternity hospitals. Frequent inspection thereof, both by the local Medical Officer of Health, and by another departmental official. Standardised aseptic technique. Insistence on the provision of the necessary minimum appliances for the treatment of shock and hæmorrhage. A monthly return from all hospitals detailing the work of the past month, and its results. Compulsory notification of puerperal pyrexia. The immediate evacuation of septic cases. Disinfection of hospitals after infections have occurred, followed in extreme

cases by the temporary closure of the hospital. The provision of small district maternity hospitals under the control of local Hospital Boards.

In Relation to the Public.—The establishment of ante-natal clinics in various centres. The provision of such clinics throughout the country is under consideration. The provision of aseptic outfits for labour in certain centres. The extension of such provision throughout the country is under consideration. Propaganda by pamphlets on ante-natal care and kindred matters.

It would be idle to pretend that so far these measures have borne important fruit. The majority of them are still too young to be ripe for fruit bearing, while others fail through the persistence of tradition and vested interests. It is as impossible to sweep away the effects of tradition by a gesture as it is to abolish all insufficiency and danger from maternity hospitals by a stroke of the pen. Medical conservatism is no more superficially rooted now than it was when Meigs, in reply to Oliver Wendell Holmes, said, "I would rather attribute puerperal fever to the working of Providence, which I can understand, rather than to an unknown infection of which I can form no idea." The speaker was very confident of his own comprehension of the results of the acts of the Almighty. If we could only be as confident of the results of our own acts, and so act that the results would be as we would have them, all would be well. Meigs was muddled, and we are little better. Perhaps, however, out of our muddle the perfect system may eventually be evolved.

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